Gleanings in Bee Culture

Established 1873

May, 1956 Vol. 84, No. 5

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Subscription Rates: United States, Canada, Pan American countries, and Spain, one year, $2.00; two years for $3.50; three years for $5.00. Single copy, 20c. Other countries, 50c per year additional for postage. Discontinuance: Subscription stopped on expiration. No subscriber will be run into debt by us for this journal. Change of Address: Give your old address as well as the new and write the name to which the journal has heretofore been addressed. Remittance should be sent by post office money order, bank draft, express money order or check. Contributions to Gleanings columns solicited; stamps should be enclosed to insure return of manuscript to author if not printed. Advertising Rates: Advertising rates and conditions will be sent on request. Results from advertising in this journal are remarkably satisfactory. Advertisers' Reliability: While the publishers do not guarantee advertisements in this journal, they use utmost diligence to establish in advance the reliability of every advertiser using space in this journal.

Entered as second class matter at Post Office at Medina, Ohio. Published monthly. Opinions expressed by the writers in these columns are not necessarily the opinions of the editors.

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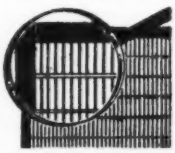

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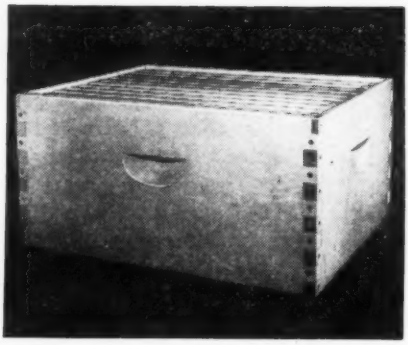

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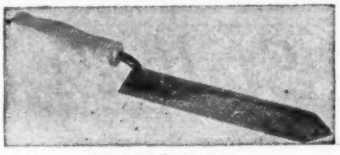

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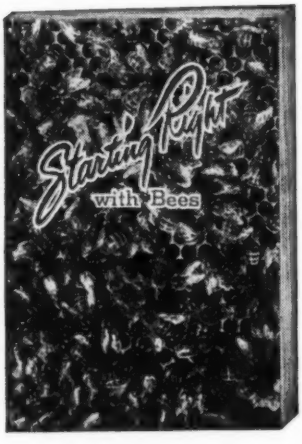

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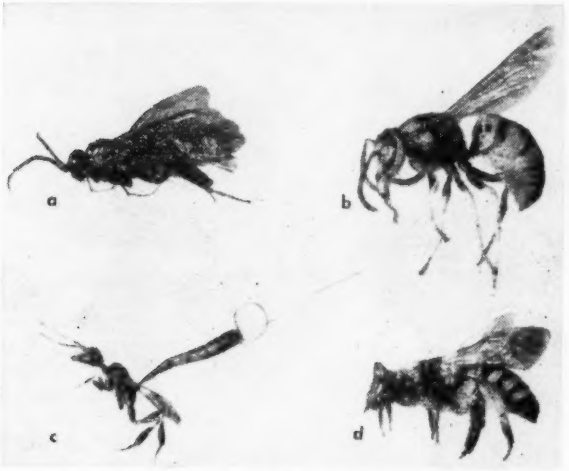
Bees. Their place in the world of insects.

Are honeybees really tops in the insect world? What other insects feed on nectar? The answer to these and many other questions are given in this report.

GEORGE E. BOHART
and
WILLIAM P. NYE

U.S.D.A., Agr. Res. Serv., Entomology Res. Branch, in cooperation with Utah Agricultural Experiment Sta.

WHAT CHARACTERIZES the order Hymenoptera to which bees belong? The name means "membrane—wing," but that doesn't help much since most insects have membranous wings. Still, what simple name could be devised that would characterize the diverse assemblage of sawflies, parasitic wasps, stinging wasps, ants, and bees that make up the order?

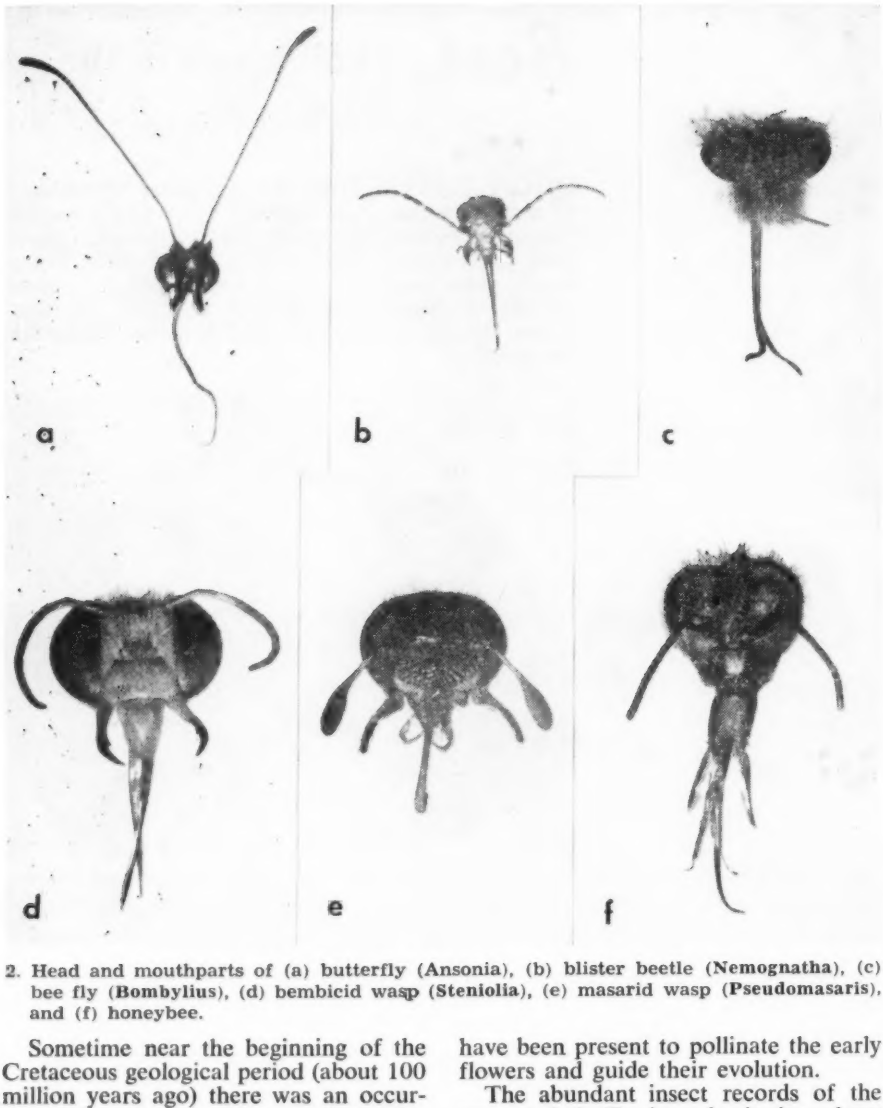


1. (a) Sawfly, (b) aculeate wasp, (c) parasitic wasp, and (d) bee (alkali bee).

There is probably no easily recognizable structure or habit that is unique and at the same time universal. If it were not for the broad-waisted sawflies and horntails, the extremely narrow waist might serve the purpose, especially when you consider that this body division occurs between the first and second abdominal segments. (How many beekeepers realize that the bee's first abdominal segment is plastered onto the thorax?) The sawflies with their mobile larvae also spoil the otherwise universal hymenopteran feature of having stationary larvae that depend on a complete food supply within easy-reaching distance. Certainly in no other order is there as great a contrast between the helpless, degenerate larva and the agile, responsive, and resourceful adult.

Development Through the Ages

The sawflies and their allies are obviously links with now extinct ancestors that probably also gave rise to other orders with complete metamorphosis. They were already in existence in the remote days when conifers were the only seed-bearing plants.



2. Head and mouthparts of (a) butterfly (Ansonia), (b) blister beetle (**Nemognatha**), (c) bee fly (**Bombylius**), (d) bembicid wasp (**Steniolia**), (e) masarid wasp (**Pseudomasaris**), and (f) honeybee.

Sometime near the beginning of the Cretaceous geological period (about 100 million years ago) there was an occurrence of great importance to the evolution of all terrestrial life—the development of flowering plants. The earliest flowering plants were pollinated by insects. Beetles must have been the benefactors since they were about the only flower-loving insects around at the time. By the end of the Cretaceous period most of the modern orders and many of the modern families and even genera of flowering plants were flourishing. Unfortunately, the fossil record on insects of this period is so poor that we can't identify the insects that must have been present to pollinate the early flowers and guide their evolution.

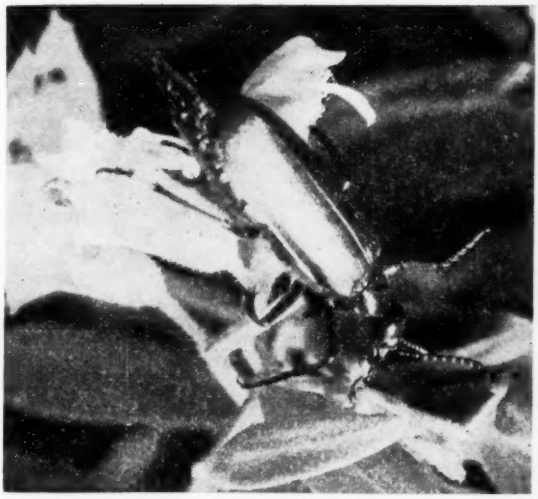
The abundant insect records of the next period (Tertiary, beginning about 60 million years ago) show clearly, by the diversity of moths, butterflies, flies, and narrow-waisted Hymenoptera, that these forms must have originated in the Cretaceous period while the flowering plants were making such great advances. Simple logic tells us this must have been the case, because neither the flowers nor the insects could have developed their many specialized forms alone.

Of what good would be the deeply hidden nectar of the larkspur without

the long-tongued bees to utilize it and, incidentally, to pollinate the flowers?

Of what good would be long tongues without deeply hidden nectaries to be tapped?

Ants appeared early on the scene. Their activities are seldom associated with flowers directly, and it seems likely that they arose before the flowering plants. Beautifully preserved specimens in Baltic amber show that most of the genera in the early Tertiary period were already set in the patterns that exist today. Caste systems were fully developed, and associations with plant lice were already formed. At the same time many bees were present, but they nearly all belonged to primtive genera now extinct.



3. Blister beetle (Lytta) feeding on blossoms of wild sweet pea.

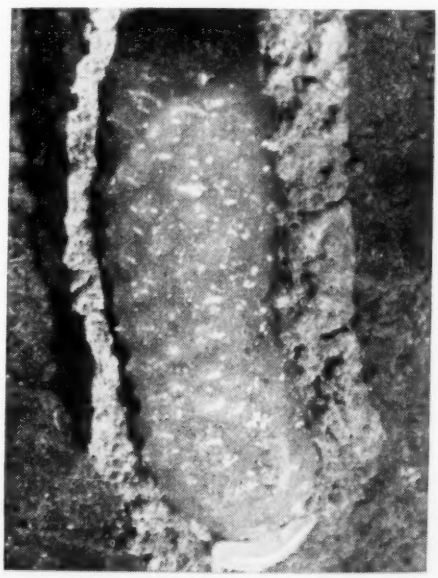
Insects as Nectar Feeders

The habit of feeding on nectar from flowers is found among less than half of the beetles, about half of the flies, more than half of the Hymenoptera, and nearly all of the butterflies and moths. The degree of specialization for this purpose follows about the same order, although at least a few members of each of these orders are highly specialized for taking nectar from flowers with long, narrow corolla tubes (Fig. 2).

Among the Hymenoptera only a few groups are highly specialized for taking nectar. Most of them simply use their short tongues to lap the exposed or partially hidden droplets of nectar from such flowers as maple, carrot, and sunflower. However, the long tongue is by no means restricted to bees. Certain genera in widely different groups, such as cuckoo wasps, sand wasps, and masarid wasps, have mouth parts as long and specialized as almost any found among bees (Fig. 2).

Although many insects feed on nectar directly from flowers, bees are almost the only ones that store it for future use. However, a few other stinging (aculeate) Hymenoptera, such as honey ants, honey wasps, and masarid wasps, supply their nests with honey made from nectar and honeydew. As many of you may already know, the honey ants store their honey in the bodies of a special caste of ants instead of in cells.

Pollen-feeding insects are somewhat less numerous than nectar feeders. Some of the beetles are well-known pollen feeders, but the trouble with



4. Cell of masarid wasp (Pseudomasaris) opened to show the egg, the jelly-like honey and pollen.

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them as pollinators is that they often feed on stamens, pistils, and petals as well (Fig. 3). Most of the Hymenoptera eat small amounts of pollen while they are imbibing nectar from flowers, but outside of the bees, only the masarid wasps store pollen in their nests (Fig. 4). In spite of the similarity in their habits, bees and masarids originated from widely different kinds of insect-storing wasps.

Are Honeybees on Top of the Heap?

We like to think that the honeybee represents the height of industry, fecundity, social development, and insect intelligence. Perhaps we do the lowly ants an injustice. They have had the social habit much longer than bees, and the many kinds of ants have invaded (and sometimes all but conquered) a much wider variety of habitats. Most species have a greater diversity of specialized forms than the honeybee, and who can doubt their industry?

5. A thread-waisted wasp (Sphex) tamping her sealed nest with a clod of earth.

Some ant colonies far outstrip honeybee colonies in size, and many queen ants are more "queenly" in proportions than the honeybee. In these connections the ants themselves are put to shame by the still more lowly termites, some of which have colonies that number their individuals in the millions.

The queen termite is an egg-laying machine without peer. Some of the more specialized queens turn out 6,000 to 7,000 eggs a day for 15 to 20 years. Queens of one species of African termite were observed to lay eggs at the rate of one every two seconds, or 43,000 a day. Maybe we should be promoting royal jelly produced by termites!

Honeybees outdo the crawling creatures when it comes to flexibility of habits and trackless pathfinding, but some of the solitary wasps also excel in these fields. Furthermore, it is only among certain solitary wasps that inanimate objects are used as tools. The more advanced species of **Sphex** tamp their nests with pebbles or clods (Fig. 5). This places them among a select company of tool users that includes the weaver birds, bower birds, higher apes, and man.

Perhaps the proudest boast of the honeybee is the mathematical precision of her architecture and the orderliness of her housekeeping. Most of the social insects build their quarters according to a rough plan but with a style that is crude and apparently haphazard. Even in this department honeybees are rivaled by the paper-making wasps, whose hexagonal combs resemble those of the honeybee (Fig. 6). Some of the

(Continued on page 317)

6. Abandoned nest of a yellow jacket (Vespula) showing hexagonal paper cells.

Fighting the Wax Moth

Reported by
GEORGE P. GEORGHIOU, Cyprus

The wax moth is beekeeping's No. 1 menace. If not controlled regularly this pest can destroy an apiary in a short time.

WAX MOTHS cause heavy damage to colonies during the summer and autumn months, and to stored combs throughout the year. The reason why colonies are especially susceptible during the autumn is that the bee population is low, due to the scarcity of nectar. Defense against wax moths by the weakened colony is thus less effective.

The wax moth is grey in color and flies almost entirely at night. It may be seen during the day if, for example, containers with old unprotected pieces of combs are disturbed.

The moths choose to lay their eggs preferably in weak colonies to which they have easy access; the eggs are deposited in cracks of the hive or at the lower margin of combs. These eggs hatch in a few days and the worms burrow into the combs and feed chiefly on pollen, pupal cases (cocoons), and other impurities in the comb.

In spite of their name, it is doubtful if the wax worm can consume wax or honey. When fed entirely on wax and honey these worms do not develop into the adult stage. As the worms feed they move from cell to cell travelling usually in a straight line and their path is marked by bits of wax, larval castings, and silk which they secrete for protection.

Most strong colonies will resist attack effectively by stinging and destroying the worms, but weak colonies, however, defend themselves less effectively and run a serious risk of being exterminated.

In about one month, in summer weather, the worms are fully grown, measuring about one inch in length. At this time they spin a cocoon usually against the wood of the hive and remain inactive as pupae for about 10 days. The pupae give rise to the adults

Suggested Fumigants for Control of Wax Moth*

1. **Paradichlorobenzene.** (PDB-moth crystals) a crystalline material used in many homes to control clothes moths. It vaporizes slowly in piles of supers, and the odor will repel or kill moths. PDB crystals may be placed on pieces of paper and left underneath the covers that are on top of piles of supers. Honey will absorb the odor of these crystals, so never use it to fumigate comb honey, or place PDB in direct contact with stored cappings or comb material. Unused crystals will dissolve in the wax and damage it. Use 6 tablespoonfuls for each 5 supers, or 5 to 10 lbs. for each 1000 cu. ft. of storage space.

2. **Calcium Cyanide.** (Cyanogas "A" Dust)—a powdery material which releases hydrocyanic acid gas in contact with air. It should be placed underneath the stacks of supers. Cyanogas "G" Dust is granular and slower acting, but may be substituted. Use 1 tablespoonful for each 5 supers, or 1 to 2 lbs. for each 1000 cu. ft. of storage space.

3. **Methyl Bromide**—a gas compressed to liquid form, released by special applicators from one-pound cans, or directly from cylinders. Do not open cans without using applicators. This fumigant will kill the eggs of the wax moth. Use 1 to 2 lbs. for each 1000 cu. ft. of storage space.

4. **Carbon Disulfide**—a liquid which vaporizes on exposure to air; inflammable and explosive. Recommended to fumigate comb honey as well as supers. Use 2 tablespoonfuls for each 5 supers, or 10 lbs. for each 1000 cu. ft. of storage space.

5. **Sulfur Dioxide**—released by igniting sulfur moistened with alcohol, or by spreading sulfur on live coals. Special sulfur candles may also be used. To reduce danger of fire the container holding the burning sulfur should be set on bricks in a large pan containing water. Sulfur fumes will bleach some fabrics and tarnish certain metals. Sulfur dioxide does not appear to cause any flavor damage to comb honey fumigated with it. Use 4 to 8 lbs. for each 1000 cu. ft. of storage.

*From Cornell University Extension leaflet, "Protect your profits from the wax moth enemy," by W. L. Coggshall. Reprinted with permission of the N. Y. State College of Agriculture at Cornell University.

Fumigation Tips*

1. Length of fumigation with most materials, except slow vaporizing para-dichlorobenzene, should not be less than 12 hours and preferably 24 hours.

2. Storage rooms or individual piles of supers should be as air tight as possible to prevent escape of gas. A room of stored combs should have the supers piled criss-cross to get better distribution of fumigants.

3. Store supers in cold basements or buildings and reduce the possibility of damage, since wax moths develop very slowly at low temperatures. Less damage may occur if combs are exposed directly to light because wax moths prefer darkness.

4. Inspect supers every two or three weeks and repeat treatment if necessary. Supers at the top of piles are more likely to be infested than those below. And combs that contain much pollen are most likely to show early infestations.

5. Wax moths other than the kind already described sometimes damage combs; control them the same way.

6. Calcium cyanide is the only one of these fumigants lighter than air. Use an electric fan to distribute the others in the storage rooms.

7. Use fumigants with care, for misuse can cause death.

* From Cornell University Extension Leaflet, "Protect Your Profits from the Wax Moth Enemy". Reprinted by permission.

and thus the life cycle is completed. There are several generations of wax moths during the year.

How to Control Them

Control of wax moths must be practiced both in the bee yard and in the storage room. The best protection a colony has against wax moths is a strong bee population, in which there are more bees and a higher spirit of self defense. If some of your colonies are below par, inspect them regularly and destroy any worms which may be present. It is a good idea to brush off regularly the small pieces of wax, cell cappings, and pollen which fall on the bottom board because moth infestation often starts from this area.

In storage, combs can be protected by fumigation with one of several materials available. First make sure that the place where they are stored is airtight. Cracks must be closed with adhesive tape. A good idea is to place combs in empty supers which are then stacked up. An inner board is placed on top of the stack and all cracks are closed. The following materials are available locally and may be used for fumigation of stored combs:

1. **Sulphur Dioxide** — This can be produced by placing sulphur on ignited charcoal or it can be ignited if first moistened with alcohol. The sulphur is burned at the bottom of the stack of supers. The quantity recommended is four to eight pounds per 1000 cubic feet of storage space. Since there is danger of fire, the lower combs of the stack should not be closer than 50 cm. from the burning sulphur. Sulphur dioxide does not cause off-flavor to honey found in the combs being fumigated.

2. **HCN (Cyanogas)** — This is a deadly gas produced by a powder

Facts to Remember

Suggested Fumigants for Control of Wax Moths

Characteristic	Paradichloro-benzene (PBD)	Calcium cyanide (Cyanogas)	Methyl bromide	Carbon di-sulfide	Sulfur dioxide
Poisonous to humans	No (?)	Extremely	Extremely	Yes	Irritating
Inflammable	No	No	No	Very	No
Explosive	No	No	No	Very	No
Weight compared with air	Much heavier	Slightly lighter	Much heavier	Much heavier	Much heavier
Quantity for five supers	6 table-spoonfuls	1 table-spoonful	Not practical	2 table-spoonfuls	Not practical
Quantity for 1000 cu. ft. storage space	5 to 10 pounds	1 to 2 pounds	1 to 2 pounds	10 pounds	4 to 8 pounds

* Reprinted from September 1953 Gleanings. Let's Control Wax Moths by W. L. Coggshall, Cornell University, Extension Apiarist.

(calcium cyanide) which is also used locally against hornet nests. One tablespoonful of the powder is placed on a piece of paper at the bottom of a stack of five supers and left undisturbed for at least 24 hours. Larger spaces may be fumigated by using two pounds of the powder per 1000 cubic feet of space. Because of the dangerous nature of HCN its use is advisable only if the stack of supers to be fumigated is outdoors or in an open shed. Always avoid breathing in the vapors of the material.

3. **PDB (Paradichlorobenzene)**—This material is available in crystal form and is also used commonly against clothes moths. About six tablespoonfuls of crystals vaporize and repel or kill the moths. Honey absorbs the fumes of PDB so this material should not be used if honey is present in the combs. It should also never be placed in direct contact with wax or cappings as it will dissolve in the wax and spoil it.

For best results, the fumigation with any of the above materials, especially with sulphur, should be repeated after three weeks and then at one-month intervals until the combs are returned to the hives in the spring. It is advisable to ventilate the combs for about 24 hours before placing them back in the hives.

Tomato Pollination

by EARL COLVIN

I HAVE been pollinating tomatoes in the Hammonton district for about five years but have been pollinating several large fields the past two years. People ask me why I sell tomato pollination. The first reason is that I am a salesman and my bees must earn me money, so I put them to use wherever I find they do good and are profitable to my clients. Perhaps the beekeeper never saw a bee working tomatoes, but I have. Now you may ask what they do. We all know that pollination is a great help in the setting of fruit or vegetables and also the developing of a heavier crop and a much finer quality of fruit or vegetable.

The tomato that was not pollinated may not develop properly. By this I mean as to shape and form. This does not mean too much to the cannery tomato but the tomato that is home used and sliced for the table that has not been pollinated has a softer inside around where the seeds grow and appears much more mushy. The well-pollinated tomato will be firm and the seed sections are perfectly formed and make a more beautiful tomato to sell or to serve at the home or where sliced tomatoes are served.

The honey from the tomato plant has a glassy green look and a very pleasant taste. This we observed while my bees were working in a tomato field last summer when the state inspectors made their annual visit. They remarked on our pollinating tomatoes and observed the honey taste and color. I expect to serve many of my clients again this year.

Philadelphia, Pa.

HOW to Control American Foulbrood with Sulfa

W. W. CLARKE, JR.
Pennsylvania Extension Apiarist

SULFATHIAZOLE, while it is used widely as a cure for American foulbrood, has certain limitations. It probably does not kill the spores of the foulbrood bacteria (**Bacillus larvae**). If this is true, there is danger of spreading the disease even more widely. The treatment must be used with care to be effective.

The sulfathiazole treatment will produce a positive control, though not necessarily a cure, for foulbrood. In addition, it is inexpensive, readily available, and can be used by any one who will take the time and care necessary. No special equipment is needed.

The best advantage is that the bee equipment need not be destroyed. One exception to this is very badly infected combs. It is better to replace these combs so that the colony can begin to build up more quickly.

Best results are obtained when the sulfathiazole is used in a thin sugar sirup, composed of one part granulated sugar and one part water by volume. One pill of one-half gram strength is used to each gallon of sirup. Lesser concentrations are not effective and larger doses do not seem to be more effective. The medicated sirup should be fed when there is no honey flow to insure effective use of the sirup. It is wise to remove all possible stored honey to be sure the bees use the medicated sirup rather than stored honey to feed the larvae. The sulfa pill should first be crushed in warm water, then heated almost to boiling to dissolve the sulfa. It is very difficult to dissolve the pill in sugar sirup.

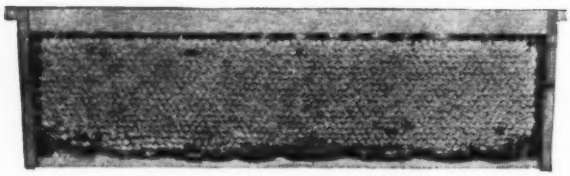
Many Ways of Feeding

Any method of feeding may be used, since the important thing is to get the medicated sirup to the larvae. Most beekeepers prefer to use the feeder can inside the super, or the Boardman feeder at the entrance of the hive. Some feeding is being done in the open with fair results. The one great trouble with this type of feeding is the danger of robbing by the bees. Quick results are obtained by spraying or sprinkling the medicated sirup over all combs in the hive body and supers. This spray method insures a large intake of sirup. The bees will clean up the sirup and probably store most of it in the brood nest and use it for feeding brood. The sulfa must reach the brood the first few days to be effective.

Preventive feeding is being done by some beekeepers and in this way it is possible to keep the disease from appearing. The same procedure as above is followed. Sulfathiazole is fed to all bees in the spring and fall, and at any other time that feeding is done.

XUM

The VANISHING



Honey Supply

A national honey shortage has developed.

Reports H. L. MAXWELL

GOOD HONEY of table quality has been in short supply ever since I can remember (for almost a quarter of a century). If adequate efforts at distribution were sustained, I would say there has been a national shortage of good honey for this total period.

Remember the phrase, "Honey is always best when it comes fresh from the hive"? What, inevitably, always happens to it afterwards? For the purpose of debate, I shall propose herewith an answer and a solution. . . .

Lack National Honey Grading Rules

First of all, the fault lies in our lack of adequate nationally applicable honey grading rules, and the resultant chaotic situation in packing and distribution of honey as a result of the lack of such rules. So, I propose a new (I hope!) approach to the grading of honey—a basic approach, of only two considerations:

1. Do I want it when I see it? (Honey, of course!)
2. Is it fit to eat?

If the two above requirements are not met, then the honey is relegated to a third position, and should—at best—be disposed of only through industrial channels (to the best possible advantage, of course).

In further discussion, such an approach to the grading and classifying of honey would anticipate, and, possibly prevent the re-occurrence of the chaotic conditions that prevailed during World War II when highly unpalatable honeys were sold in huge volume over the country, and millions of customers were disillusioned about its appeal when they tried honey (as a substitute) for the first time. (Barely palatable blends of honeys were also offered by legitimate American packers during this period.)

This new approach to grading will quickly separate the non-table honeys from those of table quality. Then, the producer will discover (when only good honey is sold as table honey, properly processed) that he cannot produce enough to supply the demand. . . . He will discover that consumers will again buy honey eagerly because of its exquisite goodness. (Consumers will cheerfully pay more, too.)

"Honey Boot-Legger"

The shady packer and "honey bootlegger" will be eliminated. The practice of buying the cheapest honey, always first—with just enough of better honey blended to make it barely passable — presenting it for distribution through conventional channels (plug-

ging them up, since repeat sales lag) to consumers will be stymied.

Here's the crux of the matter. When buyers buy the cheapest honeys first, load the market outlets with such honeys, and because of resultant poor sales to consumers find there are ample stocks of the cheaper honeys in supply, then the better grades (true table grades) of honey go begging for a volume market. Presently, financial pressure on the honey producer, because of obligations of various kinds, will force him to accept a lower price for his product—a price little better if any than was paid for the poorer grades in the first place. So, as a result of inadequate or ineffective honey grading rules, the national honey market is depressed (in too many cases, destroyed) and what is actually a national shortage of good honey is made to look like a national glut. . . .

When poorer grades of honey (nontable grades) are removed from the market by deliberate segregation, or, by chance as happened this past season, then the demand will exceed the supply for good honey in spite of a bumper crop (as also happened this past season!). Poorer grades of honey were in short supply, though the overall national crop was quite large; poorer grades were snapped up first—following custom, because of lower price—but, this time, because of some unusual factors, it went mainly into industrial channels, not to the table market.

The weakening tendency in August was quickly reversed, in spite of a heavy crop forecast; the market for good honey firmed, rose, and kept rising. Support levels were quickly lost sight of in the light of selling prices. This past season, we witnessed the first important price rise since the war at, and following, harvest time. In spite of one of the biggest crops, now honey is in short supply!

Here, then, is the answer to our marketing problem—realistic and compulsory grading of honey, proper channeling of its distribution. Prohibit the sale of industrial grades of honey on the table market, or compel accurate labeling so that the consumer may be informed. . . . Then, table grades of honey will always bring a premium. There is a national shortage of it. (The industrial grades will sell higher, too, if properly processed and merchandised.)

Berryville, Va.

Honey Price Support Announced

THE U. S. DEPARTMENT of Agriculture announced today that honey will be supported during the 1956 marketing season, which starts April 1, at a national average price of 9.7 cents a pound. This is 70 per cent of the current parity price adjusted to the 60-pound container level. For the 1955 crop of honey the national average support level was 9.9 cents per pound, equal to 70 per cent of parity.

Price support for honey within a range of 60 to 90 percent of parity is mandatory under the Agricultural Act of 1949, as amended.

The program for the 1956 honey crop is substantially the same as the one in effect last year. It provides for farm-storage loans and purchase agreements on U. S. Grade C or better extracted honey which is stored in 60-pound or larger containers in approved storage and is not objectionable in flavor. Beekeepers or cooperative associations of beekeepers can apply for loans or purchase agreements directly to the Agricultural Stabilization and Conservation (ASC) county offices.

In announcing the honey price support program, the Department again urges beekeepers to increase their efforts toward utilizing bees in pollination of important pasture, seed, vegetable, and fruit crops on a remunerative basis. The honey price support program authorized in the Agricultural Act of 1949 is intended to extend interim financial assistance to beekeepers, thus providing them an opportunity to market their production of honey in an orderly manner. The Department also emphasizes the importance of continued and intensified activity in improving the marketing and distribution of honey by all the elements in the industry.

Detailed information regarding the program, including support prices by classes of honey and areas of production, will be available at ASC county offices in the near future.

XUM

You can eat honey

and diet too!

Says ALFRED E. LEIGHTON
Consulting Food Chemist

Illustrated by
V. R. STEPHEN

TO THE estimated 34 million people in the country who have become so-called calorie watchers, some of the most recent nutritional findings from eminent researchers in the laboratories of Harvard and Cornell Universities, will be hailed with relief. Lovers of honey, and others with a "sweet tooth", need no longer forego their favorite sweets. Their consumption in reasonable amounts is not incompatible with reducing diets.

The foregoing is based on the findings of research men into the "why's and wherefore's" of obesity, and why people become overweight.

Disregarding the emotionally unbalanced people, who eat to excess because of some mental disturbance of a temporary or chronic nature, and the rare people who have some glandular condition which interferes with normal metabolism — all the rest are overweight, because they eat too much, based on the amount of work they do.

"People eat when they are hungry; but what makes them hungry?"

According to investigators, when the level of dextrose sugar in the blood (so-called blood sugar) is low, a signal, so to speak, is flashed to the hypothalamus (a part of the gray matter located in the head) and a feeling of distress, recognized as hunger, is felt. To relieve that hunger, people eat as soon as possible after the pangs are experienced. In due course, the mechanical effect of putting foodstuffs into the stomach, plus the processes of digestion, release sugar to the blood stream until the required body level is reached and a feeling of satisfaction ensues. At that point, if the average person would stop eating, all would be well. However, many of us like our food so much that we eat more than is necessary. The result is the piling up of the excess food as overweight—it's as simple as that.

Do you have an overweight problem?

An understanding of the physiology of how the eating of sugars (sucrose, honey, and the like) helps to control the total amount of food one eats, and the maintenance of a reducing diet is desirable. Actually, what happens is the elevation of blood sugar levels, which takes place quickly after sugar consumption; and according to what has been said previously, hunger crav-

ings are satisfied and a decreased amount of food is eaten.

Sugar (the chemist's sucrose), when eaten, breaks down in the stomach and small intestines within minutes after swallowing. It is then inverted into dextrose and levulose (identical with the sugars found in honey) and in the course of one to four minutes appears in the blood stream. Therefore, if sugar in any form is eaten before a meal, or as a between-meal snack, the blood sugar level goes up and appetite is dulled—that is the key to the whole situation.

Honey, on the other hand, does not have to be broken down or inverted. It already exists in the form that the body can utilize without further ado; so, if anything, it is more speedy in its hunger assuaging effects than sucrose itself. This cannot be said for any of the synthetic sweeteners, saccharin or sucaryl. They cannot dull appetite, because they cannot raise blood sugar levels—an important disadvantage for reducing dieters.

It follows, therefore, that when in need of a hunger stopper, honey can be eaten with advantage between meals. Smaller meals will be eaten and reducing diets become more easy to live with. Sugars, as all carbohydrates, provide four calories per gram on a dry basis; proteins the same, but fats yield nine calories per gram—two and one-fourth times as many as the other categories of foodstuffs. If anything, dieters should watch their fat intake, and not their reasonable sugar consumption.

In conclusion, let it be said that for many years a lot of public misinformation concerning foods has existed. Among such misconceptions is the popular belief that sugars and foods rich in them, are fattening. The same concern is held regarding other carbohydrates, such as starches and cereals, as well as fats. In truth, there are not any foods that are specifically fattening, neither are there any that are non-fattening. All foods supply calories (a measure of energy values) — some foods more than others. But, it is not the calories as such that make people fat — only the calories that are **not** burnt up, as energy will do that; for the calories that **are** burnt up can never be deposited as fat!

Once this is recognized a clue to more sensible eating becomes apparent. No single food should be avoided—not sugar, not honey, not cereal, not dairy products, not anything that makes up a balanced diet. Everything should be eaten, although smaller helpings are permissible. The sensible way to reduce is to cut down on everything proportionately, while still maintaining a balanced intake of all necessary foods. Modern realistic reducing diets include sweets as an aid to weight control.

After all, a teaspoonful of honey provides only about 21 calories, a teaspoonful of sugar about 18, and an average adult requires from 2300 to 3200 calories per day, depending on body weight and activities of the adult. A teaspoonful or two, or three of honey, used in the way the dieter prefers, add little to the total daily intake of calories because they cut down on the other foods eaten. So long as energy expended is greater than energy consumed — the result will be a calorie deficit. A calorie deficit continued long enough, will cause a loss of body weight. That is what the dieter is after in the long run and it is more easily achieved with a controlled consumption of sweets.

It's not the calories in food, as such, that make people overweight—only the calories that are not burnt up.

Riverdale, New York City, N. Y.

QUEENS [redacted] and QUEENS

by LEE STEWART

Northern chunk honey producer comments on southern queen breeders policies, attitudes, and their stock

THIS IS the age of queens; no event is a success without its queen, selected for beauty and the conformity of curves. But bees have always had their queen though we haven't given her too much attention until recent years.

For a long time we have accepted the theory that the queen was the life of the colony yet not until lately have we tried to make use of it. Due to the peculiar method of mating, progress was slow before artificial insemination. The short period of reproduction has also been a big help as several generations could be developed in a single season thus accelerating certain tests. But certain qualities like production and wintering require a full season. As a result of recent research and discoveries on queens and queen breeding some of our old accepted theories as well as some recent ones have been rudely shattered.

For many years queen breeders thought they would get pure matings if their queen yards and immediate territory was saturated with the desired drones. And often they did. But our research laboratories and field stations have discovered queens sometimes go six or more miles to mate, which is one explanation for some of our mismated queens.

Some Recent Discoveries

We have recently discovered some queens mate as many as six times[1] whereas for years we thought they mated but once. This plural mating poses two problems, the first of course being she may wander far beyond her intended drone and mate with some foreigner. But more serious is the fact the sperm of the different drones does not immediately mix with one another in the queen's spermatheca,[2] in fact it may be a year before they do so.

So what happens? Just this: the queen uses the sperm of one drone until it is used up, and then another, and so on. Now if one of these drones should have been an undesirable we will have an entirely different progeny so long as his sperm lasts. But after the different sperms mix, the progeny will carry characteristics of all drones concurrently. This discovery explains something we have always known but did not understand. On numerous occasions we have had queens that were apparently purely mated on inspection. But on a later inspection the bees were so different in color and temperament we thought surely the queen had been replaced, only to find on inspection she was the same queen as before.

To further confuse the queen breeder we were told at Biloxi that physiologically bees are not resistant to AFB; some were just better housekeepers than others. Many of us have known this all the while but were afraid to speak out loud. This is the reason for the success of sulfa; it inhibits (stops the growth) of the disease germs and thus gives the bees an opportunity to clean house.

And still another discovery though not as yet thoroughly understood: We have had bees from high-priced queens reared by reputable breeders that were so cross we had to kill them. The breeders swore they were gentle and we talked to fellows who had used them in other states and they, too, said they were gentle. We discounted the breeder's statement on the supposition it was based on nuclei (small colony)

[1]Bee Facts. Gleans. June 1955. Pg. 354.

[2]Taber, Stephen III. Sperm distribution in the spermatheca of multi-mated queen honeybees. J. Econ. Ent. 48: 522-25. 1955. See also "Bee Facts". Feb. '56 Gleanings. Pg. 107.

behavior which is practically always gentle. And we know even normally gentle bees are cross when working on certain plants. But what we can't understand is why bees working sweet clover in Minnesota are gentle when their nieces are hornets on sweet clover in Indiana.

A careful study of the above discoveries should explain to the purchaser a lot of queen failures; it should also help the breeder solve some of his problems, part of which are his own making and some, like the weather, beyond his control. We have visited and talked to many queen breeders and as a result we believe the reputable breeder is doing the best he knows how to produce a satisfactory queen. Even among queen breeders there is a difference of opinion.

At Tampa we listened with amazement to a well-known queen breeder boast about his wife being able to find, catch, and cage 100 queens per hour. Right away we thought we understood why some of our apparently good queens were superseded as we don't think any one can cage queens that rapidly without injuring some of them. Naturally we were surprised at Biloxi to hear other queen breeders discussing this same assertion; g o o d breeders privately told us 30 queens was a good hour's caging.

Difficult to Obtain Desirable Stock

We know a little about queen breeding as we rear some queens each season. However, due to our northern location we must depend upon the South for our early stock. At times it has appeared to us the queen breeder considered any queen-like bee that had four wings and six legs good enough for us. And we have even gotten them with five legs. You may say we are too particular. However, we know the job that has to be done and what it takes to do it. In order to find what we wanted we have used queens from 20 odd breeders in a single season. Our biggest complaint has been the inconsistency of a breeder's stock from year to year. We will search around all season to find the bee we want only to get a different one from the same breeder the next season.

As we are in a two-crop area it is rugged on queens as she has to lay approximately twice as many eggs as she would in a one-crop territory. She has simply got to be good. There's one thing in particular we never thought the southern breeder understood. Most northern beekeepers are honey producers and purchase queens for that purpose. If a queen proves worthless it means we have lost the use of the colony she headed for that particular honey flow, for by the time we are able to appraise her it is too late to requeen and build up the colony for that flow.

So our queen must be vigorous and prolific; we don't want propolizers and this is asking a lot in our propolis-laden territory. We will not tolerate burr and brace combs. Due to our heavy fall flow we must have a bee that is not afraid of the cold. (We have them that work freely in 50 degree or lower temperatures.) And since we love to work with bees, gentleness means more to us than a few extra pounds of honey.

To get this kind of stock we purchase each season many Italian queens from the South, queens that are bright, vigorous, and large. The purpose of these queens is to furnish drones to mate our own stock. If our southern queen is what we hoped for this cross gives us the best bee for our territory. They winter well whereas the pure southern stock does not; they are prolific and two croppers. They produce better than the average and are easy to manage; and important to us with a late fall flow they will work on those cool days.

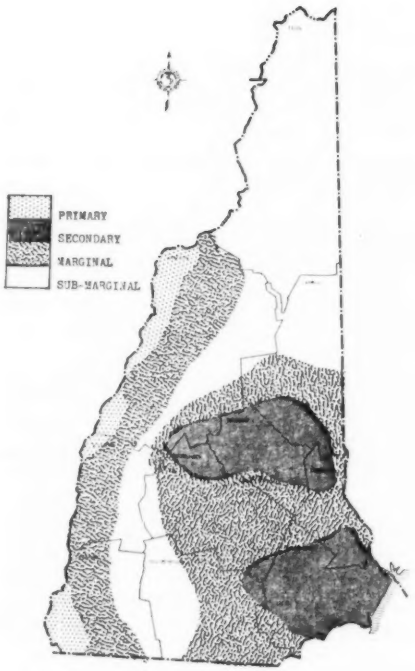
Newport, Indiana

"I know Jenkins . . . . the housing situation is bad all over."

WHEN I ATTENDED the meeting of the American Federation of Beekeeping at Baltimore, Maryland, I ran across a beekeeper from Nebraska who told me that he and his three brothers had more than 12,000 hives of bees. Twelve thousand hives of bees staggers my imagination, because that is a lot of bees; a lot more than there are in the state of New Hampshire.

There was also a very exclusive organization which was known as the 500 Club. You had to have 500 hives of bees to belong to this Club, but the president, who by the way, was one of four brothers, explained to us that it really wasn't a snobbish organization. It was just an organization of people who had more bees and felt that they needed to put up a little more money than the little fellow to keep the work of the American Federation of Beekeepers financed.

We have one beekeeper, Philip N. Townsend of Lebanon, New Hampshire, who has 500 or more hives; just one, but sad to say as far as New Hampshire is concerned, most of the



beekeeping in New Hampshire

J. R. HEPLER, University of New Hampshire

honey he produces comes from the limestone area of Vermont or its wild thyme-covered mountains or from lush New York. It is just a hop, skip, and a jump from the Connecticut River to the Hudson River and Mr. Townsend's bees are scattered in smallish groups in these three States.

New Hampshire, in a way, is going back to the Indians, as the saying goes. A hundred years ago, probably 50 per cent of New Hampshire's land was cultivated; today, the foresters tell me that 85 per cent of it is covered with forest and the forest is rapidly creeping in on us.

Most of our forest trees are not honey-bearing trees. We have, of course, fruit trees which probably yield very little or not at all. We have basswood in southern New Hampshire, but it is rather scarce and it yields about every third year. There are very few honey-producing trees other than the ones mentioned; nor are there many honey-producing shrubs — Clethra in southern New Hampshire and that pernicious Japanese bamboo yield honey. I think the button bush yields honey in swampy areas. The smooth sumac is a dependable honey plant, but not as dependable as in Connecticut.

However, the maple trees do yield a little honey that the bees use to build up in spring. We have been accustomed to using maple sirup. We get it in

rather large quantities and we have our sugar orchards which sometimes yield rather well; other times, not so well and most New England people prefer maple sugar or maple sirup to honey and its products. In fact, so much so that maple sirup sells from $6.00 to $8.00 per gallon at the present time, which is, of course, more than twice the price of honey.

However, a little incident happened a few years ago that makes the maple sirup producers wonder. I was in Phil Townsend's apiary along in late May and I looked at the record of his scale hive. I noticed that it had gone up 15 pounds or so, so I called his attention to it, and he said yes, that he figured that his apiary of 400 hives around Lebanon, New Hampshire, had increased at least a ton and a half in weight from a heavy red maple flow. He said that his brother Harry had ranged the woods for four or five weeks through snow, mud, and slime for enough maple sap to make 18 gallons of maple sirup for his total crop or less than 200 pounds. Mr. Townsend said he didn't have to turn his hand over for a ton and a half of honey. The bees gathered it for him.

New Hampshire agriculture is specialized. It is mostly poultry, dairy, and specialized crop agriculture. We export apples, potatoes, corn, blueberries, squash, and some cucumbers, in addition to dairy, poultry, and some forest products.

Now, I doubt whether bees help the poultry industry particularly or the potato industry but they are very necessary in the pollination of apples and blueberries. They help squash a lot and the dairyman who has his white and sweet clover pollinated with honeybees has far less trouble with his pastures. Then in addition, we have some wild raspberries which follow the logging of our woods. The beekeeping then naturally follows the areas in which dairying and horticulture predominate; along the Connecticut and the Merrimack Rivers and in the southern fruit-growing areas and in the central blueberry areas.

The blueberry flow is very interesting. I have installed three-pound packages of bees on the 20th of May that by the 4th of July had from one to two shallow supers of surplus honey. I have opened up over-wintered hives that were hauled up on the mountainsides for blueberry pollination that had as much as 100 or more pounds of surplus honey. Probably all of it was blueberry or raspberry. Whether the New Hampshire beekeepers could move their bees onto these areas and really make quite a lot of honey out of them, is problematic, because the roads up on the mountain side are usually pretty bad.

New Hampshire's honey then, is usually a mixture from many sources; perhaps a little fruit bloom; perhaps from dandelions; perhaps a little maple honey, followed by clover, sumac, and occasionally basswood or raspberry and blueberry. No flow during late July and August, but as a rule there is a heavy fall flow from goldenrod and asters, and yet the fall flow isn't too dependable.

When Editor Deyell, of Gleanings, hefted my hives in July, 1954, he told me that they were entirely too light. I said I wasn't particularly concerned because I knew I would get a good fall flow to carry them through the winter and yet when the time came to put the bees away, my scale hive was 37 pounds lighter then it had been after I took my honey off. In other words, the fall flow was absent; perhaps due to the fact that the two hurricanes whipped the goldenrod and aster plants so badly they produced neither honey nor pollen. My honey yields vary. Sometimes the average from my 20 to 25 colonies is as low as 12 pounds per colony, then again in the exceptional year it may be 150 pounds per colony.

We produce extracted honey. We do not have the intense flows to make large yields of comb honey and it is only the exceptional beekeeper who can produce comb honey, although the hobby beekeeper always tries comb honey.

There is a thriving association in New Hampshire. Perhaps not too many members belong to it, but we have well attended meetings and the beekeepers are always interested in learning more about handling and taking care of bees —the interest of the hobbyist.

Our foulbrood inspection has cut the diseases from 17 per cent during the war years to about one or one and one-half per cent at the present time.

Durham, N. H.

XUM

Spring Management

HOWARD A. PIKE, Rhode Island Apiary Inspector

IT MAY WELL be said that there should be no cause for spring management, at least not during early spring, if we have obeyed the laws of the bees, in providing them with sufficient winter stores to last until early plants come into bloom. If too much of their honey is not taken away for our own use, they ordinarily have enough to carry them over. If we upset the balance which they strive to maintain, they may die before spring. Therefore, we must take proper precautions in the fall.

If we are doubtful as to their condition, we must examine them early to see if there is sufficient honey, pollen, and a queen with plenty of workers to start the colony on its way to another prosperous season. Where colonies are protected from the cold winds with some sort of covering on the hive, it is best not to remove the covering until quite late in the spring, as this is a time when the bees are rearing a lot of brood. If the nights are still cold, and sometimes the days also, the bees may contract the cluster causing some of the brood to chill and die. What little brood there is in the hive after poor wintering may become chilled and it is better if the colony is not opened until more settled weather is at hand when it can be opened and given a more thorough examination.

Experienced beekeepers can tell pretty well what the conditions are inside of the hive without opening it, by watching the bees at the entrance, and by lifting the hive to see if there are enough stores. If pollen is being gathered in large quantities the beekeeper may be fairly certain that there is a queen in the hive. This last statement does not always hold true, however.

It sometimes happens that a condition which is beyond our control will cause trouble within the hive. An exceptionally severe winter with long periods of confinement without a cleansing flight, together with poor stores, will cause a condition of dysentery and spring dwindling. The bees are compelled to retain their feces so long that they generate excessive heat by their distress, upsetting the entire colony.

First Examination

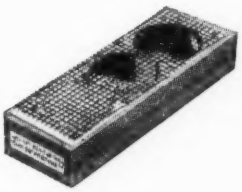
When that nice warm day arrives in spring and the outside temperature is 60 degrees or higher, it will be the signal to light the smoker and see what is going on inside the hive. At this time the early spring flowers and a succession of warm days are sending the bees to the fields for nectar and pollen which stimulates them to build up the colony to greater strength for gathering the main harvest later.

We are most concerned now about the queen and as we hunt for her on the combs we look at the brood on each comb, to see if she is laying well, and expanding the brood nest as a good queen should. **We also look for signs of disease during the early inspection.**

If all conditions are as they should be, we will see brood in all stages of growth, occupying cells in six or seven combs, not in all the cells on the combs, but two-thirds, at least. The queen will be busy laying eggs, steadily increasing the quantity as the season advances, providing there are enough nurse bees to warrant her expanding the brood nest. This one feature is more important than a hive full of honey, for if there are not enough bees of the right age to feed and care for the larvae, the queen will lay only in proportion to the number present. It is apparent why it was so important to provide a young laying queen sometime during the previous August.

(Continued on page 314)

WHY and WHEN to REQUEEN



ROBERT M. MEAD

WHEN I STARTED beekeeping 25 years ago my instruction book said that all colonies should be requeened each year in August. I believe that the man who wrote it had a good idea and sound principles but it is possible that he never tried to run a large number of colonies without help and under the pressure of never having quite time enough to do the absolutely necessary things, such as getting the crop off and extracted and the bees fed and packed for winter.

The idea of a young queen each August is all right, at least in theory. It should insure plenty of young bees for winter and in some locations where queens wear out quickly it may still be a necessary practice. In northern Vermont I soon learned that it did not fit in well with our work at all. August is the month most of our crop is harvested. August is the month the stores and roadside stands need the most attention if the crop is to be marketed. We don't have the time to hunt up old queens and replace them and as we learn more about the life of our bees I don't believe we would do it if we did have the time. Why kill a good queen and replace her with a young one of uncertain value just because the calendar says August?

If August requeening does not suit us and if requeening all colonies does not suit us one might well wonder just what we do do in this matter. I would say that we do a good deal less than one might expect and that we still produce good crops of honey. Year after year we do not average to requeen over 25 per cent of our colonies and the bees in the natural course of events take care of the other 75 per cent very well. I would like to have every beekeeper consider this very seriously, that the bees themselves are well aware when the time comes that they need a new queen, that they often replace the old one in one way or another, and that when you go through and requeen every hive in a yard you may just be raising the devil with your bees.

Some explanation is necessary and I'll try to tell you how it works with us. Give or take a few days either way, our most active season with the bees is from May 1st to July 15th. During May and the first few days of June we

try to give every colony a good going over. We check on stores, note the amount and character of brood, find the queen and clip one wing if she is not already clipped. The facts concerning the queen are briefly noted on a record block and as we follow the same procedure every season it is easy to glance at the record block and tell the age of the queen.

A point I'd like to make is that most every spring we find we have a good percentage of young queens that need clipping. Some of these were raised when the bees tried to swarm the previous season, some were raised in normal supersedure after the swarming season. Anyway, these bees have done their own requeening, and they do it much more often and better than a lot of beekeepers realize.

Of course the bees are not infallible. Like humans they make errors in judgment and have accidents happen to them. For instance, a swarm may carry an old failing queen too long and lose out entirely or if something happens to a virgin on her mating flights, which is possible, they lose out entirely. It is our policy to bridge this gap by taking corrective measures when it is impossible for the bees to do so.

I don't think that any one has to be a genius to note when a colony is in trouble, and note it early enough, on the average, to save the swarm before they slip too far down the non-productive scale. As I have mentioned, we make one very intensive spring inspection, several others not so detailed, and we check most hives several times during the early part of the flow when swarming is most prevalent. I don't mean by that that we have a lot of swarming. I mean that we check just to see what the bees have in mind, either as to swarming or filling supers.

During any or all of these inspections any colony that does not come up to the yard average for the season is immediately noted and examined in detail at once with particular attention to the queen. Such colonies would be those that come through the winter weak, or do not build up well, or lag behind when the flow starts. If everything indicates that the queens are at fault they are requeened then, either with purchased queens carried in the truck for that purpose or sometimes with a ripe cell from a good colony if one is available.

To boil the whole thing down, we try to requeen when it is necessary and we try just as hard to avoid requeening if it is not necessary. True, an occasional colony gets by us and has to be started all over again but this is a rare occurrence.

While I am sure that most large beekeepers have developed their own procedure, and have a good reason for doing so, there is something I would like to have every beekeeper think about before he goes about requeening.

First do you have any clear idea of the age and performance of the queen you are going to replace? Are you reasonably sure that your prospective replacement is actually an improvement? If the colony is weak or unproductive, is the queen actually at fault, or is it diseased, or have the mice been in it, or is it a poor season?

I recognize that requeening is a powerful and useful tool in the beekeeper's hands but before you use it stop and think. Don't kill good queens and replace them with a question mark.

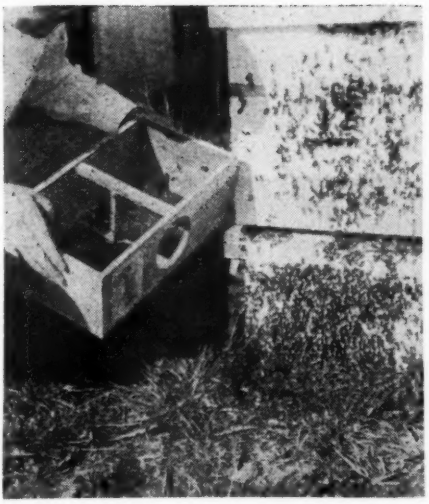
White River Junction, Vermont

A Way to Handle Laying Workers

RAFAEL GORSLINE, Brazil

IT IS GENERALLY considered that a queenless colony with laying workers is hardly worth saving, and that the best treatment is to destroy the bees. This seems to me an unnecessary waste because the situation can usually be remedied by simply giving the colony a caged queen cell.

As an extra precaution one may move the colony a short distance, placing combs without adult bees, or containing bees from another colony, in a hive on the old stand with a caged queen cell. The normal workers will return to the original site while the laying workers apparently remain in the hive. In any case after a short time the queen hatches and is accepted by the colony. After she begins to lay, all the combs may be returned to the original site.



Experiences with Package Bees

MARVIN W. KOSANKE,
Ripon, Wisconsin

WE HERE in Wisconsin doubtless have as much or more unpredictable spring weather than any other state in the North Central area of the country. From one day to the next our weather can change from the most beautiful spring day anyone could wish for to one with snow, sleet, or hail accompanied by a bitter cold wind. Very seldom do we have prolonged periods of warm days in late March and April. Usually we have several nice days and then the weather will change to rain or snow with cool temperatures. We are very fortunate when we have a warm early spring but these are few and far between.

Naturally, installing packages under these conditions presents a great many problems. When ordering packages primary consideration must be given to weather conditions that may exist when the packages arrive. At no time should the beekeeper order too many packages for one date. It is better that he should have them sent at intervals of several days instead of on a single date if there are a large number to be installed. Many times the packages will have to be kept a day or so before conditions are favorable for installation.

Installing Packages with Snow on the Ground

Twice in the past several years I have installed packages with considerable snow on the ground. Two years ago I had to shovel the snow away from the hive stand location to make it easier to install the bees. However, the temperature at the time was in the high 50's on that day so no ill effect was noticed on the bees.

Through the years I have installed packages at temperatures that ranged from 40 to 75 degrees. During that time I have observed that this great difference in temperature at installation had little or no effect on the bees as the results were similar. However, I never install any packages if the temperature is lower than 40 degrees and if it is in the 40's I like to have a day with sunshine and very little wind. I remember on one occasion I installed several packages on a cool, windy day with intermittent snow flurries. I would wait until the snow flurry had subsided and quickly hive the package. I had good results with these packages but I do not recommend this procedure.

I like to install packages on dark combs containing pollen and honey. In addition the bees are fed as much sugar syrup as they can use. Pollen is almost a necessity in the combs because if the season is late the bees cannot obtain it from any natural source and if the weather is inclement the bees cannot obtain it if it is available.

Order Packages Early

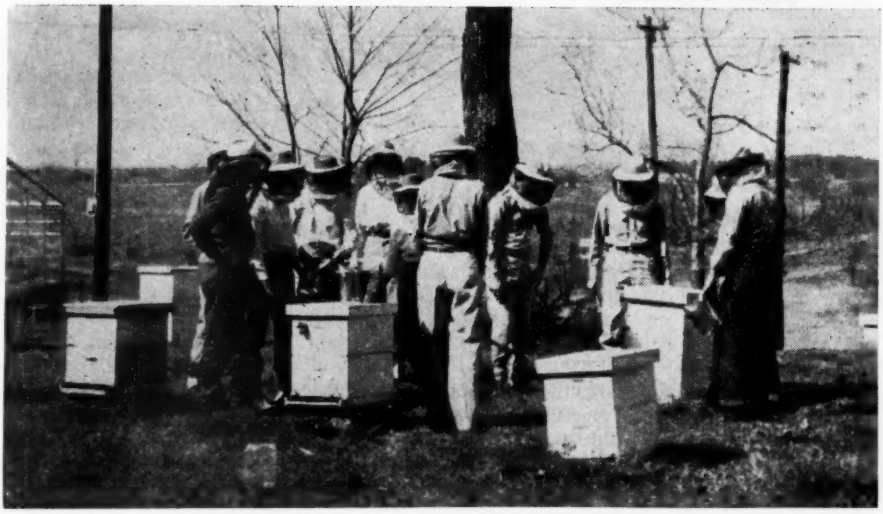
I order my packages to be shipped so that they will arrive here during the first week in April. I like to have them

(Continued on page 313)

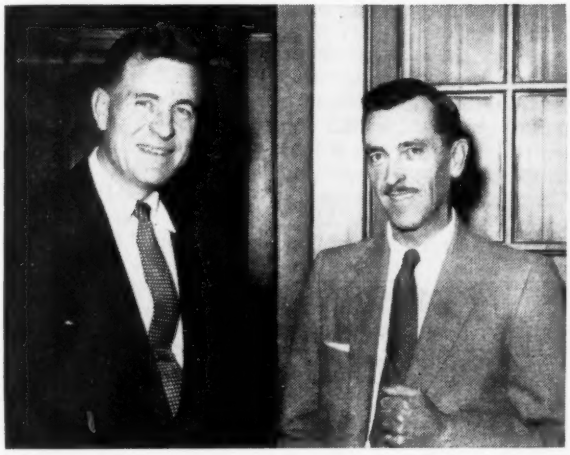
News Reel

Pennsylvania Honey Show. The large honey display at the 1956 Pennsylvania Farm show at Harrisburg attracted the attention of this young member of the Future Farmers of America. — A Beese & Stephen photo.

British Columbia Short Course. Twenty-eight beekeepers attended the beekeeping short course at the University of British Columbia. Dr. J. E. Eckert of the University of California was the main lecturer. — U. of B.C. photo.



Southern Beekeeping Class. A group of beekeeping students at the Mississippi State College watch Professor C. A. Wilson opening a hive in the College apiary. After the students receive initial instruction in how to work with honeybees, they are divided into groups of two, and systematically work the hives observing good management practices as they work from week to week. Hive weights are taken weekly and charts kept on gains and losses.



Federation Highlights. At the 1956 Federation meeting in Biloxi, the roving photographer caught Alan Root, General Manager of The A. I. Root Co., Medina, Ohio, chatting with Dr. Cecil A. Jamieson, Chief, Beekeeping Division of the Canadian Dept. of Agriculture at Ottawa. — A Florida State Plant Board photo.

XUM

Editorials

Articles on "Bees"

THE SERIES of articles on "Bees," by George E. Bohart and Wm. P. Nye of the U. S. Department of Agriculture, Logan, Utah, beginning with this issue, page 265, will cover a wide field and should be of interest to our readers.

All of us should know more about the order Hymenoptera to which bees belong, so that we may better understand the place the honeybee occupies in the world of insects. The authors of this series are imminently well qualified to bring us authentic information on this subject.

How to Revive the "Iowa Apiarist Report"

IT IS GOOD to know that our readers are responding to our editorial in the April issue of Gleanings concerning the demise of the IOWA APIARIST REPORT (see page 225). We have now learned of a second prerequisite to reviving the Report and hope that beekeepers will once again respond to our suggestion.

To establish proof of industry interest in the IOWA APIARIST REPORT, it is necessary to empty the warehouse shelves of back issues of this publication. Interested beekeepers are urged to write for the FREE back issues available as far back as 1930. Not only will the present supply of the Report be reduced but the valuable information contained in the Iowa publication will be distributed to the folks most interested. Most of the articles are as applicable today as they were when they first appeared.

Write today for your free copies of the IOWA APIARIST REPORT. A post card request to Prof. F. B. Paddock, Extension Apiarist, Department of Entomology, Iowa State College, Ames, Iowa, will bring them to you.

Food-chamber Hive Pays Off

THE LATE George S. Demuth, former editor of Gleanings, was one of the first advocates of the food-chamber hive. For eight years he was assistant to the late Dr. E. F. Phillips, head of bee culture work in Washington, D. C. Mr. Demuth during this time operated 200 colonies of bees for comb-honey production near Peru, Indiana. He took time off during the month of June to manage his bees during the main honey flow.

During his early beekeeping Mr. Demuth wintered his bees in single-story brood chambers. One fall he did not find time to remove the supers of honey stored late in the season. He worried about his bees all winter but when he opened his hives the following spring they were boiling over with bees and in much

better condition than they had been in single-story brood chambers. From that time on Mr. Demuth was an ardent advocate of the food-chamber hive. At first he called the super of honey left on, the automatic feeder, but later it was called a food-chamber.

About that time E. D. Townsend, a successful commercial beekeeper in Northern Michigan, experimented with leaving a super of honey on each hive in the fall. He had quite a number of out-apiaries and decided that leaving needed honey on colonies in the fall saved much time and labor involved in feeding his bees the following spring. Morley Pettit, of Ontario, also adopted the food-chamber idea.

At present most beekeepers winter their bees in double brood chambers. In fact, some are wintering in three stories to supply ample food as well as comb space early in the season.

An extra amount of honey left on a colony is never wasted. It is converted into bees and very populous colonies are needed to secure the maximum crop of honey. The food-chamber hive, properly used, certainly does pay big dividends.

Do Beekeepers Read Bee Literature?

A FEW COMMERCIAL beekeepers say they do not have much time for reading, and that may be a fact. Some of these beekeepers secure big crops of honey even though they have not done much reading of beekeeping literature.

Some years ago we talked with a queen breeder who had been in the business for forty years. We remarked that it is rather strange that a drone has no father but has a grandfather on his mother's side. This queen breeder apparently had never known of this.

During a large meeting of beekeepers some years ago in Newport, Indiana (500 present) a question and answer session was conducted. One question was, how many eyes does a worker bee have? The majority present did not know that the worker bee has five eyes, three single and two compound eyes.

A beekeeper does not need to be steeped in knowledge concerning beekeeping to be successful but it seems essential that he know something about the history of beekeeping, a few things about the anatomy of the bee as well as the latest developments pertaining to the beekeeping industry. It would be time well spent to take a couple of hours a week to read some of the bee journals and bee books. Beekeeping should be all the more interesting for having taken some time out to do such reading.

Bees in Trees and Buildings Perform a Service

HONEYBEES ARE very essential to agriculture because they pollinate approximately 50 farm crops, including vegetables, fruits, and legumes. It is said on good authority that honeybees are responsible for over 80 per cent of the insect pollination.

There are not enough bees in the country to do this pollinating job adequately. There is only one hive of bees to each 90 acres in Ohio. In surrounding states the bee population is much less.

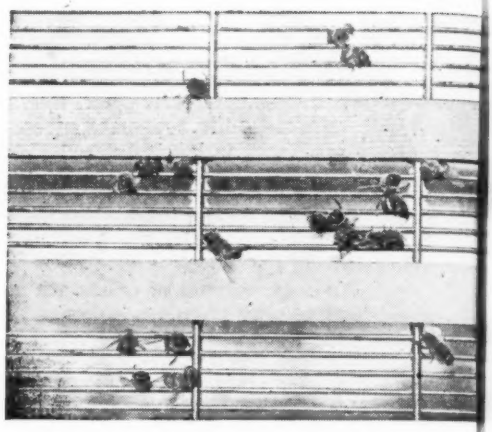
If it were not for the many swarms in trees and buildings, the pollination situation would be much worse off than at present. It would be interesting to actually know how many such swarms are in any given area. We have never heard an estimate.

A year ago this spring, the honey flow from fruit bloom, dandelions, and golden rocket in this area was unusually good. Many beekeepers, not prepared for the sudden flow were not ready for it and consequently, thousands of swarms left hives and many went to the woods. One beekeeper in Cleveland captured 18 swarms during one week.

While we deplore the fact that there are so many swarms in buildings and trees, instead of being in modern, movable hives producing honey, there is some consolation in knowing that these swarms are doing somebody some good, from the standpoint of pollinating farm crops.

XUM

Do YOU Use Queen Excluders?



Asks JOHN W. HOLZBERLEIN

THERE ARE about as many methods of beekeeping as there are beekeepers working at it, and whenever a group of them get together one question that is almost certain to be asked is the one at the heading of this article. And it is a good question. There are some who use the excluder the year round; it is as much a part of the hive as the bottom board. There are some highly successful honey and package bee producers in California in this group. There are other men who look upon the queen excluder as an abomination, would not give one storage room on the place, let alone on the hive. In this group we also find some very successful producers. Both sides have their reasons, and some of them are well founded. Taking all this into consideration let us make some "For" and "Against" observations and then we can all go right on making our own decisions.

Points in Favor of Excluders

The main points, as I see them, in favor of using queen excluders for honey production are:

1. The surplus honey can be taken off whenever the supers are filled without having to wait for the queen to be crowded out and the brood to emerge, or the alternative of sorting combs, taking those without brood and putting those back into the brood chamber that do have brood.

I know that some honey producers do not pay much attention to brood when taking off honey, and I have seen honey storage tanks where quite a layer of larvae has accumulated on top of the extracted honey. Remembering that larvae are just worms to most people, and that honey is a food and should be handled as such at all times, well, the larvae and the honey just should not be mixed, to say the least.

2. Another advantage in the use of excluders is that the queen's work may be confined to one or two bodies and thus may be better evaluated. If she should need to be replaced she can be more easily found and removed.

3. Still another important reason for the use of excluders is that poor combs, combs containing considerable drone comb, may be used in the supers without the queen being able to fill them with eggs. As a colony approaches its peak strength, especially when the flow has begun, it is the tendency of the queen to lay in every drone cell she can find. If the regular brood nest is made up of good worker comb as it should be she is quite apt to forsake it at this time and go on a regular drone-egg-laying spree in the supers. This is only a natural tendency preparatory to swarming and the consequent mating of young queens. Of course the excluder prevents this.

4. This point refers only to package-bee production, but is worthy of men-

tion. Here the use of the excluder makes the actual shaking of bees faster as the bees do not need to be "strained" to prevent loss of the queen and keep from selling the purchaser a lot of drones which he neither needs nor wants. So much for the defense of the excluder.

Points Against the Excluder

The greatest fault, most universally found is that the queen excluder acts as a **honey excluder** as well, preventing the bees from storing the honey in the supers and encouraging them to store it in and around the brood nest soon causing it to become honey bound. This is especially true in the case of colonies that have not reached full honey-gathering strength, or when the supers and excluders are put on at the same time.

It is also claimed that excluders retard the development and expansion of the colony, and I must go along with this claim. Pollen is not readily carried through an excluder. Heavy pollen storage and the expansion of the brood nest usually go hand in hand. When the barrier of an excluder is reached at this time both functions are checked in their natural course which is upward, and then the brood nest must be rearranged to allow for expansion in a lateral direction. This takes a little time and may slow up the queen just enough to allow the swarming impulse to be set up ahead of the time that it would have occurred if the queen had been allowed to expand in the normal upward manner.

Quite often the time gained without excluders will be just enough to allow the honey flow to start and the storing impulse to take command of the colony. If the queen is young and good, and enough room is provided, the swarming impulse may be avoided entirely.

A third fault found with excluders is that they are just another piece of expensive equipment to be purchased and maintained. They are fragile, to say the least, and demand careful handling. If the wires become sprung the queen will soon find her way up through them. A leaky excluder is as bad or worse than no excluder.

Summing up the Question

We have developed a use for excluders that takes advantage of their benefits and yet avoids most of the drawbacks. We operate about one-third of our colonies by the two-queen system. This demands the use of two excluders while both queens are present for they must be kept separated by some comb space to insure against the disappearance of one queen. This leaves a part of our bees without excluders in the early part of the season. As the colony expands we add another set of combs and reverse the original brood chambers, thus allowing the queen unrestricted expansion in an upward direction during the time when swarming is most apt to become a threat. But as the honey flow increases and the extra excluders become available from our two-queen colonies we shake the bees and the queen (if she may be up there) out of this top super and put the excluder on top of the old two-story brood nest. She has had her fling. The honey flow has begun in earnest. And there are usually both brood and nectar in the top super at this time. All this will cause the bees to readily pass through the excluder. It is not the barrier that it would be if there was nothing above it but empty combs. At this time we add extra supers, the ones with the drone comb if we want to, and wish them well. When the flow is over we can take the honey without fear of finding it intermixed with brood. This method also serves to restrict the storage of pollen to a large extent to the two-story brood nest where it will be covered with honey and sealed, becoming of great value for the rearing of early brood the following spring.

Meeker, Colorado

Cover Picture

The drones are coming. The arrival of these lazy creatures has been recorded for our cover by W. W. Wittekindt, internationally known beekeeping photographer. Mr. Wittekindt is a student of bee behavior at the Institute of Bee Culture, Bonn, Germany. We hope soon to publish an article by this German scientist on the beekeeping research going on in West Germany.

XUM

For Coffee Time

MRS. BENJ. NIELSEN
Aurora, Nebraska

Honey raisin coffee cake.—
Photo courtesy Kellogg Co.

COFFEE TIME, that great American institution, the pause that picks you up, refreshens you, and doesn't let you down. Stop in any restaurant, or the tiny eating houses that dot the highways along about ten and three o'clock, and see what's going on. Nor is the coffee break confined to the men folks and public eating places. Mom pauses for a coffee break, too, possibly having neighbors or friends in to share it.

Here's a grand way to give honey in cooking a real boost. Just be prepared to serve some honey baked goodie each time you serve coffee to guests and watch them ask for the recipes. Honey baked goods, in case you didn't know, have delightful flavor and excellent "fresh keeping" qualities.

Try these for coffee time:

Honey Raisin Coffee Ring

One cup whole bran cereal, ⅓ cup buttermilk or sour milk, ½ cup honey, 1 egg, ¼ cup soft shortening, 1 cup sifted flour, 1 teaspoon baking powder, ¼ teaspoon baking soda, ½ teaspoon salt, and ½ cup seedless raisins.

Combine bran, buttermilk, and honey; let stand about 10 minutes. Add egg and shortening; beat well. Sift together flour, baking powder, soda, and salt. Add to first mixture, together with raisins, stirring only until combined. Fill greased 8¼-inch ring mold about ⅔ full. Bake in moderately hot oven, 400 degrees F. about 20 minutes. Remove from ring mold; let cool. Frost with thin confectioners' icing. Yield: 8 to 10 servings.

Confectioners' Icing

One cup sifted confectioners' sugar and 2 tablespoons hot milk or light cream.

Combine sugar and milk; stir until of spreading consistency. Spread at once over coffee ring.

Honey Peanut Butter Cookies

One-fourth cup shortening, ½ cup peanut butter, ½ cup sugar, ½ cup honey, 1 egg, 1¼ cups sifted flour, ½ teaspoon baking powder, ¾ teaspoon soda, and ¼ teaspoon salt.

Combine shortening, peanut butter, sugar, honey, and egg and blend thoroughly. Sift together flour, baking powder, soda, and salt and stir into first mixture. Chill dough. Roll into balls about the size of walnuts. Place three inches apart on a lightly greased baking sheet. Flatten with a fork dipped in flour in crisscross fashion. Bake until set but not hard, about 10 to 12 minutes in a moderately hot oven, 375 degrees. Yield: 3 dozen cookies.

Honey Butterleaf Rolls

One cake or package of dry yeast, ½ cup lukewarm water, 2 tablespoons shortening, 2 tablespoons honey, 2 teaspoons salt, ½ cup milk, scalded, 1 egg, and 3½ to 4 cups sifted flour.

Soften yeast in lukewarm water. Add shortening, honey, and salt to milk. Cool to lukewarm and add yeast and beaten egg. Stir in flour to make a soft dough. Turn out on floured board and knead until satiny and smooth, 8 to 10 minutes. Place in greased bowl, cover, and let rise until doubled in bulk. Punch down. Let rise again until doubled in bulk. Punch down and let stand 10 minutes. Roll out in rectangular sheet very thin. Brush with melted butter. Cut into strips about one inch wide. Pile 6 to 7 strips together. Cut into 1½-inch pieces and place on end in greased muffin pans. Let rise until doubled in bulk. Bake in hot oven, 425 degrees F., 12 to 15 minutes. Tops may be sprinkled with sugar before baking for a sweeter variety. Sprinkling rectangular dough with grated cheese and nutmeats is another delightful variety.

Live and Learn

by Propolis Pete

IT WILL be interesting to see how my package bees build up this year, because conditions are going to be different. As a rule, I save a lot of combs with pollen in them to start packages. This year I haven't got any. I saved the combs all right, but we had a bad storm last fall that upset the applecart and now I have to do it the hard way.

Since I don't have the storage room indoors to keep the hive bodies containing pollen combs, I built me a rack outside the honey house and stack the supers on that. I put on the covers and rope them down so that they won't blow over. But the big wind blew them down regardless, and then the rain flooded the combs. The pollen got mouldy, and my prize combs are one sweet mess.

Pollen substitute is the obvious answer, but for some reason or other my bees have not been taking it for the past couple of years. When the idea first came out, I bought myself some soy flour and brewers yeast, made it into dough with honey and fed it to the bees. They thanked me profusely then, but suddenly they stopped taking it and haven't done so ever since. What happened I don't know, but suspect that it is because they didn't need pollen. I have tried it every which way—dry in boxes outside, in cakes mixed with honey, and also some mixed with sugar. They just don't even go to see what is in it.

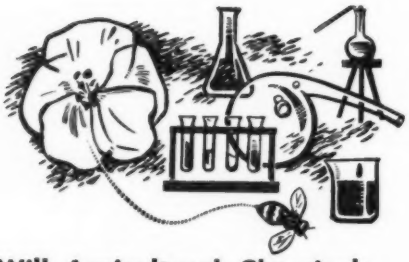
Generally when the bees don't do something that you think they should do, it is because they have better ideas. Starving men probably would start a riot to get dry bread, but how many would put themselves out to get it if a nice juicy steak were offered instead? With onions. We can't blame the bees for doing what we would do ourselves, under the circumstances. So, logic tells us that pollenless package bees are going to take it and use it, providing there is nothing in the fields, or if the weather keeps them from flying out for it.

The weather — phooey. I am still waiting for spring. In other years we have heard peepers as early as St. Patrick's Day. Here it is early April but no peepers yet. In fact there still is a big snowdrift across my front lawn. Guess the peepers can't get down to the water. In case you don't know it, peepers are generally a sign that spring finally has arrived. They are tree toads and apparently they run a matrimonial agency on the banks of ponds or big puddles. They sit there and auction off their services with a highly pitched "peep-peep", which gives them their name. Then they get married and proceed to raise their families before the puddles dry up. There are a few other signs that give promise. Here and there a crocus is coming through the ground where the snow has melted away, and in the middle of the day a dozen bees wait in line for a chance to get in each blossom.

Stores are going fast and I have dry sugar feeders on all of the colonies that appear light. As usual, the bees in some hives take it readily and others don't even bother to look. I am quite sure that the answer is that when they have honey they won't put forth the effort to melt it down, but when they are hungry they will go to a lot of bother to get water and melt it. This fits into the theory about the bees not taking pollen substitute, too. I notice that if a colony does not take it, if you sprinkle a little water on it, they are only too glad to get it. Maybe that is not the right answer, but it will do until another comes along. Anyway, it makes me feel better to do it, just as winter packing makes me feel more comfortable whether or not it does any good.

Darn this waiting for warm weather. When it is the middle of winter we are more or less resigned to waiting. There are a lot of things to do getting ready for the new season, and it is too miserable to do anything outdoors anyway. But at this time of the year there is nothing more to do inside, and nothing outdoors that you can do either.

XUM



Bee Facts

(A Digest of Scientific Research)

Edited by Walter Barth

Will Agricultural Chemicals Destroy the Fertility of our Soil?

INVESTIGATORS at Utah Agricultural College found that methoxychlor, dieldrin, aldrin, and endrin when added to the soils inhibited the soil nitrifiers at concentrations of about 200 pounds in the first six inches of soil. They found that dieldrin and aldrin were most toxic. If these insecticides are used in concentrations recommended for insect control, they will not affect the bacteria converting ammonia to nitrates enough to bring about significant changes in soil fertility.

The insecticides disappeared more rapidly from soils receiving low concentrations of insecticides and from soils high in organic matter.

Results of this study indicate that farmers should use caution in applying insecticides. If used in large amounts they will reduce the fertility of the soil by injuring the micro-organisms. If used in concentrations recommended by the manufacturer, evidence indicates that the insecticides can be used with little danger of injury to soil micro-organisms.

Farm & Home Science. Vol. 17. No. 1. March 1956. Pg. 18-19.

Key to the Wax Moth Larvae

IN CALIFORNIA five species of moths are associated with honeybee combs, while in Wyoming a sixth moth pest can be added to the list. A key for the identification of these moth larvae has been prepared by George T. Okumura. Interested readers can secure a copy of this key by writing to the author at the Bureau of Entomology, State Office Building No. 1, Dept. of Agriculture, Sacramento 14, California.

Okumura, George T. Illustrated Key to Lepidopterous Larvae Associated with Honeybee Combs in California. Mimeo T-4. Nov. 15, 1955.

Perils of the Patio.

NOW THAT spring is here doctors will be getting more requests for treating bee sting allergies. At this time of the year folks are inclined to seek the flowers near the patio on the first warm day.... so will the bees. So if any of your neighbors are allergic to bee stings this is the time to seek the aid of your family doctor. Proper treatments can eliminate bee sting sensitivity.

New England J. Medicine. Vol. 253:1. Pg. 37-38.

First Bees and Now Turkeys

A TURKEY poult was hatched from an unfertilized egg at the USDA Research Center, Beltsville, Md. The poult is the first known parthenogenetic origin to hatch and live for more than a few hours. (On March 22 it was 12 days old.) USDA poultry husbandmen discovered parthenogenesis in turkey eggs four years ago.

The most serious problems facing the turkey industry are fertility and hatchability of eggs. Parthenogenesis may help research workers investigate these problems.

In experiments at the Research Center, a large number of embryos have formed, but only a few developed to final stages before dying in the shell, and only four have pipped their shells and hatched alive. Of these, one bird hatched two years ago from among 5,000 infertile eggs, lived for 18 hours. Three have been hatched in experiments this year with some 3,000 infertile eggs. Of the three, one lived eight hours, the second only five hours. Parthenogenesis is a natural function in many lower forms of life such as **bees** and **aphids.** It has been induced in eggs of such animal organisms as star fish, sea urchins, and frogs, but until this discovery, it had never been known to occur in higher animals.

Honey Plants Let's Talk about

HARVEY B. LOVELL,
University of Louisville

New Jersey tea or redroot (Ceanothus americanus)

Ceanothus is a genus of shrubs belonging to the buckthorn family. The species are widely distributed and known by a great variety of common names. In the eastern states the common species is known as redroot or New Jersey tea (**C. americana**). As shown in the photograph, great masses of white bloom somewhat resembling a cluster of lilacs, completely cover the plant in late May and early June. This species ranges from Quebec south to Florida and Texas. A great variety of insects form clouds over the flower clusters, and one entomologist collected 382 species in Virginia, more than have been found visiting any other flower in North America.

North Carolina. W. A. Stephen writes that redroot is common in the mountains where it is said that bees will even leave sourwood to work it. It is important to beekeeping in the southwestern part of the state. Bees collect both nectar and pollen. It does not seem abundant enough to produce much of a surplus, however.

Snowbush (**Ceanothus velutinus**) blooms from June 1 to July 15 in California according to Clarence Wenner of Glenn. It produces a light amber honey with a heavy body but a sharp to bitter flavor. He sometimes obtains as much as 100 pounds surplus from a strong hive but the average is only around 30 pounds. Snowbush fails about 40 per cent of the time because the bloom may freeze.

Mahala Mats of **Squaw Carpets** (**Ceanothus prostratus**) is a low, trailing shrub with branches which root at the nodes forming dense mats. The blue flowers in small umbels bloom in May and June. Bees work the flowers freely and in the vicinity of Seattle, Washington, it has been reported to produce a surplus.

Buckbrush (**Ceanothus cuneatus**). These shrubs which grow up to eight feet tall have clusters of white flowers and are common on dry, rocky slopes of mountains and offer bee pasture in early spring. Clarence Wenner writes me that buckbrush blooms in March in California and through July in the high mountains and sometimes yields considerable nectar but usually it is just a stimulating flow. The honey is white of good quality.

Snowberry (**Symphoricarpos** spp.). An interesting report of a surplus from snowberry or buckbrush has been sent by Leslie H. Wallin, Trenton, North Dakota. He writes, "I once had a yard near Cedar Breaks in southern Utah which produced a 70-pound average of snowberry honey at an elevation of 8000 feet. The honey is water-white and has never granulated, although I kept a sample for 10 years. Here in North Dakota the bees work snowberry along with clover."

Willow (**Salix** spp.). There are many species of willows belonging to the genus **Salix** and many are of value to beekeepers. The flowers are insect pollinated and yield nectar freely. Leslie Wallin reports that "When I was operating in Western Montana near Missoula, I once had a hive on scales gain 10 pounds per day on three con-

(Continued on page 318)

FROM Foreign LANDS

Translated and Edited by Erika Barth

Beeswax Helps to Scare Ghosts Away

ON AUSTRALIA'S remote Melville Island, funeral ceremonies provide the chief social activities for the resident aborigines, according to Charles P. Mountford, Leader, National Geographic Society Melville Expedition.

"Death corroborees, or dances, continue for months after each burial, until the final ritual, the pukamani, can be held. Such prolonged ceremonies are necessary to set at rest the deceased's spirit, which is regarded as evil."

In preparing the final ritual dance, a male aborigine mourning a diseased relative, will spend as much as five hours working on his make-up. His body is rubbed with charcoal, then painted with a shirt of ocher and clay; ocher powders his hair. His attire is complete with a topnot of cockatoo feathers, a beard of goose feathers set in BEESWAX, and a ball of goose-down suspended from the neck by a rope of human hair. This custom is designed to prevent the dead man's spirit from recognizing the living relative of the deceased and harming him.
National Geographic Magazine, Mar. 1956. Pg. 425.

Bee Stings Heal Blindness

FOR MORE than four years, 67-year-old Josef Scherrle of Regensburg, Germany, was blind due to an arthritic condition. Today he can see again for a distance of two meters (about seven feet). His sight was restored, thanks to 20 bee stings.

Mr. Scherrle traveled to an English clinic in the city of Bromley, south of London, after he heard that another fellow sufferer was cured there by bee stings. Julia Owen, head mistress of the clinic, believes that the patient's condition will further improve with continual treatment of bee stings.
Der Imkerfreund, Nov. 1955.

Are Bees True to One Flower?

DR. O. MORGENTHALER, world famous Swiss beekeeping authority, has come up with some research that may yet prove that bees are not true to one flower. The scientist has devoted a lot of time to pollen studies.

By examining the pollen baskets of honeybees he found that the contents taken from the baskets of any single bee contained pollen from many flowers. While no data is available on this work many beekeepers are speculating on the validity of the old theory that honeybees collect pollen from only one type of flower during a flight.
LaGazette Apicole, Nov. 1955.

Honey Gives Lustre to Precious Stones

DID YOU KNOW that by boiling precious and semi-precious stones in honey they acquire a special lustre? Yes, even a beautiful color.

A very yellow topaz will turn a light pink, the zircon, on the other hand, loses its natural color and becomes so bright that it can pass as a diamond. True yellow-tinged diamonds also take on a pinkish color but return to their true color after a few days.
Der Osterreichische Imke, Dec. 1955.

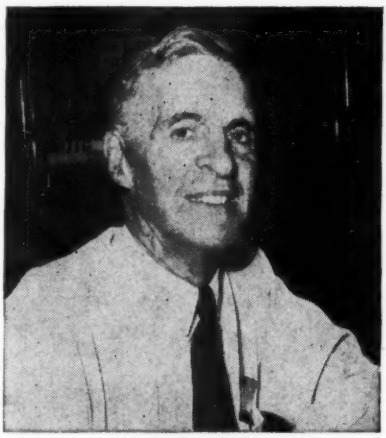
Bees in the Bedroom

IN YORKSHIRE, England, a colony of bees that had been in a roof collapsed and the heavy weight of the honey stored during the previous season broke through the ceiling.

The owners of the farmhouse consider the bees as part of the family. They were never afraid of the bees but they didn't like it when the bees swarmed. On one occasion a swarm occupied the bedroom and refused to be shifted.
British Bee Journal, Feb. 23, 1956.

A Talk to Beekeepers

by M. J. Deyell



Jack Deyell

A Four-and-a-half-year-old Queen

ON MARCH 10 of this year I had occasion to look into one of my colonies which I thought needed some food. I aim to heft the back of each hive in all yards about that time of the year. If they feel light, I mark them up for feeding by placing a brick near the front of the hive cover. I can then tell at a glance when I return to the yard which colonies need attention.

Well, upon examining the combs in this colony in question, I saw a queen which had been introduced in September 1951. She looked rather old but not entirely worn out. On looking further, I saw another queen, presumably her daughter, about five inches from her on the same comb. I have read about queens living five years or longer but took it with a grain of salt. I know definitely this old queen was introduced in 1951 because she is a Kelley's Island queen, clipped and marked with yellow paint on the thorax. I have not looked into the hive since but I shall keep tab on these queens to see how long the older one will remain in the hive. Some strains of bees have longevity characteristics. The progeny of such queens should also have this characteristic but I am not sure about this.

Every Colony as Good as the Best

This is a good objective to keep in mind but it has been my experience that colonies, even with sister queens, vary considerably in their performance. If all colonies produced as much honey as our best colony, what a whale of a crop we would have, especially some years when conditions are favorable for a crop.

It is possible, however, to give all colonies intelligent management in order that they may produce the maximum crop. If we fail to do this, the amount of surplus we secure is reduced considerably.

Importance of Good Combs

Most of us fail to appreciate the value of genuinely good combs. By good combs, I mean those consisting mainly of worker cells, drawn from full sheets of worker foundation, wired in frames. Such combs are invaluable because they help assure colonies of maximum strength. Combs containing large patches of drone cells should be removed from each brood chamber. These combs can be used in supers for the production of extracted honey. However, I have found that bees will not fill drone cells until the worker cells are all filled up.

Arrangement of Hives in an Apiary

It certainly pays in a large apiary to leave a space wide enough for a truck to be driven between the rows of hives. This facilitates the work of putting on and removing supers filled with honey at extracting time.

Hives should not be placed too close together. There should be at least six feet between the hives. If it is possible to have the apiary on a plot of ground having an occasional tree or shrub, these help bees mark their locations. When hives are placed close together, in a single straight row, with no shrubs or other objects between them, bees are likely to drift from one hive to another. Some beekeepers face one hive east and the next south, the next east, then south, etc. If hives are placed too close together, bees will drift from one hive to another and this drifting may account for some unusually large yields from certain colonies.

A part of Gleanings experimental apiary.—Photo by M. J. Deyell.

Seasons Vary

There is a quince tree in a neighbor's yard on our street that serves as a sort of barometer for weather conditions in this area. I have seen this tree in bloom as early as April 6, and as late as April 18. I have seen pollen collected by the bees the last week in March. This year, I saw the first pollen on April 2. On the 5th I checked some colonies and found brood in from two to four combs — brood in all s t a g e s. This means that if we have suitable weather for nectar and pollen during April and May, these colonies will be very populous in bees by the time the main honey flow begins in early June. As a matter of fact, some of the colonies may have to be divided, giving the queenless division a young laying queen in order to prevent these colonies from reaching their peak of strength before the main flow starts. This dividing also serves as a swarm control measure. When such colonies are divided, it is very necessary to give each division an ample amount of food.

It is inadvisable to attempt dividing colonies unless they are very populous, boiling over with bees that have an abundance of brood and honey. A simple way to divide is to lift the upper brood chamber onto a bottom board, then give this division a hive cover. Most of the brood will be in the upper brood chamber. It is important to have some brood in the lower chamber as well. Most of the old bees in the upper chamber, set on a new stand, will return to the hive on the old stand. In some instances it will be necessary to shake a few combs containing young bees, from the hive of the parent stand, into the hive of the new stand. The young bees will stay put.

If dividing is done when the weather is warm, the queenless division will rear a young queen. This will take about three weeks. A better plan is to give the queenless division a young laying queen.

How to Detect Signs of Swarming

Some colonies may be intent on swarming regardless of control measures used. It is well that the colonies give advance notice of swarming as the bees build queen cells along the lower edges of the brood combs. These cells are easily recognized because they differ from other cells. Instead of being horizontal, as are worker and drone cells, they are built in a vertical position with the openings at the lower end, and resemble peanut shells.

When the cells are first started they resemble shallow cups. A little later

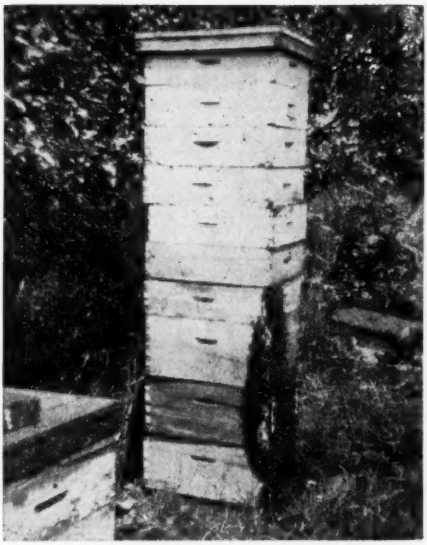
on, as the sides of the cells are being built, each cell will be seen to contain an egg. A swarm will issue after the eggs have hatched and the larva has developed—usually at the time the first cell is capped. Sometimes, during the spring months, swarm cells may be started and then destroyed by the bees when the weather turns cool.

What to Do If a Swarm Comes Out

The old method of handling a swarm was to put it into a hive on a new stand. A much better method is to set the old, or parent hive, on a new stand a few feet away, as soon as the swarm issues, giving the hive a quarter turn, thus facing the entrance away from its former position. Another hive containing either frames with full sheets of foundation or drawn combs is placed on the old stand to receive the swarm.

Frequently, the swarm will cluster on the limb of a tree. Sometimes it clusters on top of a tall tree which causes the owner to do some tree climbing. The limb, if not too large, may be cut off and the bees shaken directly in front of the hive on the parent stand. If impossible to saw off the limb, the swarm may be shaken into a large bushel basket with a wire wound around one of the handles so that after the bees are shaken into the basket, the handle may be wired to the limb of the tree until the swarm, including the bees in the air, have clustered on the inside of the basket. The basket hangs from the limb in such a position that the bees may cluster on the inside, just below the handle. After the swarm has clustered it may be carried to the hive and dumped in front of it.

A comb of brood taken from another hive and put into the hive intended for the swarm will attract the bees and cause them to get established readily in their new home. After two days, the parent hive, which was moved to a new location, may be given a quarter turn, facing the same direction as that containing the swarm, then, after several days, this parent hive may be moved to another location, at least 15 feet away. This moving should be done in the middle of the day when a large percentage of the old bees are in the field. When these field bees return and do not find their hive, they will easily find their way into the hive on the old stand, containing the swarm and will help increase the population of this new hive, and, in turn, a larger crop of surplus honey may be expected.



A skyscraper during July, 1955.

The old hive which has been moved to the new location should have a young laying queen in due time. If swarming occurs early in the season and the honey flow is long drawn out, this parent hive may store some surplus. However, as a rule, no surplus may be expected from the parent hive the same season. This will make a good colony for the following season.

May, in this latitude, is a very important month because bees produced during May are very valuable for storing the maximum crop of surplus honey during June and July. We must keep in mind the fact that five weeks are required from the time an egg is laid by the queen until a bee resulting from this egg is old enough to carry in nectar or become a full-fledged field bee.

Watch Stores

There usually is a short dearth of nectar between fruit bloom and clover flows in this latitude and further north. It is necessary to make sure that all colonies are well supplied with stores right up until the major flow begins. Some perfectly good colonies have starved to death just before the main flow starts.

Who's Who in APICULTURE

To supply a handy reference of the names and addresses of state and provincial apiary inspectors, secretaries of beekeepers' associations, extension workers in beekeeping, and other information often needed by our readers we have corrected our Who's Who in Apiculture as of April 1, 1956.

State or Province	Bees on Combs Admitted	Net Weight Law		Inspector State or Province	Sceretary State Association
		Extracted	Comb		
Ala.	No	Yes	Yes	C. A. North, Montgomery	F. E. Guyton, Auburn
Alta.	Permit	Yes	Yes	Jack Edmonds, Edmonton	F. E. Boswell, Brooks
Ariz.	Cert.	Yes	Yes	Miles D. Benson, Phoenix	Clarence L. Benson, Phoenix
Ark.	Cert.	Yes	Yes	G. W. Freeman, Little Rock	Rea H. Davis, Little Rock
B. C.	No	Yes	Yes	John Corner, Vernon	John Corner, Vernon
Calif.	Cert.	Yes	Yes	Elbert R. Jaycox, Sacramento	Frank A. Watts, Fullerton
Colo.	Yes	Yes	Yes	Homer P. Powers, Denver	Jim Smith, Las Animas
Conn.	Cert.	Yes	Yes	W. T. Brigham, New Haven	Lois Baker, Brooklyn
Del.	Cert.	No	No	John W. Dukes, Dover	John W. Dukes, Dover
Fla.	Permit	Yes	Yes	H. S. Foster, Gainesville	F. A. Robinson, Gainesville
Ga.	Cert.	Yes	Yes	J. P. Ratcliffe, Tifton	Garnett Puett, Jr., Hahira
Ida.	No	No	No	C. F. Feeler, Nampa	Dewey Olsen, Preston
Ills.	Cert.	Yes	Yes	Carl E. Killion, Paris	Hoyt Taylor, Pleasant Plains
Ind.	Permit	Yes	Yes	Gilbert Perigo, Indianapolis	Gilbert Perigo, Indianapolis
Iowa	Cert.	No	No	F. B. Paddock, Ames	F. B. Paddock, Ames
Kans.	Cert.	Yes	Yes	R. L. Parker, Manhattan	Will T. Roberts, Kansas City
Ky.	Permit	Yes	Yes	E. M. Miller, Eastwood	
La.	No	Yes	Yes	C. E. Smith, Baton Rouge	E. Bessonet, Donoldsonville
Me.	Cert.	Yes	Yes	Reginald B. Swan, Brewer	C. A. Stanhope, Bradford
Man.	Quar.	Yes	Yes	D. R. Robertson, Winnipeg	D. R. Robertson, Winnipeg
Md.	Cert.	Yes	Yes	G. J. Abrams, College Park	G. J. Abrams, College Park
Mass.	Cert.	Yes	Yes	Milo Bacon, Boston	W. R. Parker, W. Boylston
Mich.	No	Yes	Yes	Don P. Barrett Lansing	Mrs. M. Seidelman, Ionia
Minn.	Cert.	Yes	Yes	C. D. Floyd, St. Paul	Frances Sundberg, Richville
Miss.	Permit	Yes	Yes	Homer Tate, State College	C. A. Wilson, State College
Mo.	None	Yes	Yes	J. Anderson, Jefferson City	Stirling Kyd, Columbia
Mont.	Permit	Yes	Yes	Lloyd N. Graham, Bozeman	Mrs. O. R. Burdette, Laurel
Nebr.	Cert.	Yes	Yes	C. J. Walstrom, Lincoln	Mrs. Chas. Bellin, O'Neill
Nev.	No	Yes	Yes	George G. Schweis, Reno	No association
N. B.	Cert.	Yes	Yes	Adam J. Wilson, Fredericton	
N. H.	Cert.	Yes	Yes	James G. Conklin, Durham	Herman Sander, Manchester
N. J.	Cert.	Yes	Yes	J. C. Matthenius, Phillipsbg.	E. W. Suturn, Laurel Springs
N. M.	Cert.	Yes	Yes	J. R. Poe, State College	Ersel C. Edwards, Los Lunas
N. Y.	Cert.	Yes	No	A. C. Gould, Albany	Mary R. Cary, Syracuse
N. C.	Cert.	Yes	No	J. F. Greene, Raleigh	Mrs. A. L. McLean, Raleigh
N. D.	Permit	Yes	No	J. A. Callenbach, Fargo	Inactive
N. S.	No	Yes	Yes	E. A. Karmo, Truro	Philip Bishop, Sackville
Ohio	Cert.	Yes	Yes	S. E. Bailey, Columbus	Robert J. Collier, Deshler
Okla.	Cert.	Yes	Yes	C. A. Bower, Oklahoma City	C. F. Stiles, Stillwater
Ont.	Permit	Yes	Yes	P. W. Burke, Guelph	G. F. Townsend, Guelph
Ore.	Cert.	Yes	Yes	A. Burr Black, Salem	Oliver W. Petty, Albany
Pa.	Cert.	Yes	Yes	Geo. Sleesman, Harrisburg	A. R. Dean, Pittsburg
Que.		Yes	Yes	J. R. Methot, Quebec City	J. Prud'homme, St. Isidore
R. I.	Cert.	Yes	Yes	Howard A. Pike, Conimicut	Mrs. A. Laporte, Woonsocket
Sask.	No	Yes	No	Temporarily vacant	R. M. Pugh, Tisdale
S. C.	Cert.	Yes	Yes	W. H. Purser, Clemson	Earl Sargent, Greenville
S. D.	Cert.	Yes	Yes	Clarence Beck, Sioux Falls	Warren Miller, Pierre
Tenn.	Cert.	Yes	Yes	L. H. Little, Nashville	L. H. Little, Shelbyville
Texas	Cert.	Yes	Yes	C. J. Burgin, College Station	C. J. Burgin, College Station
Utah	Cert.	Yes	Yes	J. I. Curtis, Salt Lake City	J. I. Curtis, Salt Lake City
Vt.	Cert.	Yes	Yes	R. M. Mead, White River Jct.	C. N. Wood, So. Woodstock
Va.	Cert.	Yes	Yes	H. Weatherford, Vernon Hill	H. Weatherford, Vernon Hill
Wash.	Quar.	Yes	Yes	Temporarily vacant	Vera E. Miller, Tacoma
W. Va.	No	Yes	Yes	None	No association
Wisc.	Permit	Yes	Yes	John F. Long, Madison	A. R. Vosburg, Ft. Atkinson
Wyo.	Permit	Yes	Yes	C. A. Beavers, Powell	R. E. Schaefer, Riverton

United States—Division of Bee Culture and Biological Control, James I. Hambleton in Charge, Beltsville, Md.; Section of Bee Culture Research, W. J. Nolan, Beltsville, Md.; Southern States Field Laboratory, W. J. Whitcomb, Baton Rouge, La.; Inter-Mountain Laboratory, A. P. Sturtevant, Laramie, Wyo.; Bee Culture Field Station, C. L. Farrar, Madison, Wisc.; Beekeeping and Insect Pathology Lab., University of Arizona, Frank E.

Todd, Tucson, Arizona; Research Centers: Logan, Utah, George E. Bohart; College Station, Texas, A. H. Alex.

U. S. Marketing Aid: Commodity Stabilization Service, Sugar Division, U. S. Dept. of Agriculture—Harold J. Clay, Washington 25, D. C.

Dominion of Canada—Investigation and Demonstration of Bee Culture: Cecil A. Jamieson, Dominion Apiarist, Experimental Farm, Ottawa, Canada; Bee Breeding Station, Pelee Island, Ontario, Prof. G. F. Townsend in charge.

Apiary Inspectors of America—President, Prof. F. B. Paddock, Ames, Iowa; Secretary, C. D. Floyd, St. Paul, Minn.; Regional Vice Presidents: Eastern, Philemon J. Hewitt, Jr., Litchfield, Conn.; Southern, Homer Tate, State College, Miss.; Northern, Don Barrett, Lansing, Mich.; Western, Elbert Jaycox, Sacramento, Calif.

American Beekeeping Federation—President, Joaquin Watkins, Fruita, Colo.; Vice President, Ray R. Reed, Los Angeles, Calif.; Secretary-Treasurer, Robert Banker, Cannon Falls, Minn.

Ladies' Auxiliary of American Beekeeping Federation—President, Mrs. Newman Lyle, Sheldon, Iowa; Vice President, Mrs. Hood Littlefield, Pasadena, Calif.; Secretary-Treasurer, Mrs. Harold Partello, Boone, Iowa.

Bee Industries' Association—President, Robert Dadant, Hamilton, Ill.; Secretary, Frank Swanson, Council Bluffs, Iowa; Treasurer, Baxter Woodman, Grand Rapids, Mich.

Southern States Beekeepers' Federation—President, W. A. Stephen, Raleigh. N. C.; Secretary-Treasurer, Carl M. Teasley, Apison, Tenn.

Eastern Apicultural Society—President, J. Gaston Levitre, Woonsocket, R. I.; Secretary-Treasurer, Mrs. Maxine Manchester, Middlebury, Vermont.

American Bee Breeders' Association—President, W. W. Wicht, Hattiesburg, Miss.; Vice President, E. L. Garon, Donaldsonville, La.; Secretary, Garnett Puett, Jr., Hahira, Ga.

American Honey Institute—Director, Mrs. Harriett M. Grace, Madison, Wisc.; R. F. Remer, Sioux City, Chairman, Board of Directors.

National Honey Packers and Dealers' Association—President, R. C. Stone; Vice President, R. F. Remer; Secretary-Treasurer, Ken Bradshaw. Directors are: R. B. Willson, R. H. Kelty, Jourdain Demuth, and T. E. Burleson.

Honey Industry Council of America—Chairman, R. B. Willson, New York City; Vice President, John Holzberlein, Jr., Meeker, Colo.; Secretary, L. H. Little, Shelbyville, Tenn.

State or Province	Beekeeping Taught in Agri. Col.	Professor in Charge of Beekeeping Course	Extension Work Carried on	Extension Specialists in Beekeeping
Ala.	Yes	F. E. Guyton, Auburn	Yes	W. A. Ruffin, Auburn
Alta.	No		Yes	W. G. leMaistre, Edmonton
Ariz.	Yes	Frank E. Todd, Tucson	No	
B. C.	Yes	G. H. Harris, Vancouver	Yes	John Corner, Vernon
Calif.	Yes	J. E. Eckert, H. H. Laidlaw	Yes	J. E. Eckert, Davis
Fla.	Yes	Millides Murphy, Gainesville	Yes	J. D. Haynie, F. A. Robinson
Ga.	No		Yes	W. E. Neville, Athens
Ida.	No		Ltd.	Dr. Barr, Moscow
Ills.	Yes	V. G. Milum, Champaign	No	
Ind.	Limited	B. E. Montgomery, Lafayette	Ltd.	
Iowa	Yes	Walter Rothenbuhler, Ames	Yes	F. B. Paddock, Ames
Kans.	Yes	R. L. Parker, Manhattan	One day	R. L. Parker, Manhattan
Ky.	Yes	Lee Townsend, Lexington	No	
La.	No		Yes	Warren Whitcomb, Baton R.
Me.	Yes	Charles O. Dirks, Orono	Yes	Charles O. Dirks, Orono
Man.	Yes	D. R. Robertson, Ft. Carry	Yes	D. R. Robertson, Ft. Carry
Md.	Yes	G. J. Abrams, College Park	Yes	G. J. Abrams, College Park
Mass.	Yes	Frank R. Shaw, Amherst	No	
Mich.	Yes	E. C. Martin, E. Lansing		
Minn.	Yes	M. H. Haydak, St. Paul	No	
Miss.	Yes	C. A. Wilson, State College	Some	A. G. Bennett, State College
Mo.	Yes	Leonard Haseman, Columbia	No	
Nebr.	Yes	O. S. Bare, Lincoln		
N. B.	Yes	Provincial Apiarist		
N. H.	Yes	J. R. Hepler, Durham	Yes	J. R. Hepler, Durham
N. J.	Yes	R. Filmer, New Brunswick	Yes	R. Filmer, New Brunswick
N. Y.	Yes	E. J. Dyce, Ithaca	Yes	W. L. Coggshall, Ithaca
N. C.	Yes	W. A. Stephen, Raleigh	Yes	W. A. Stephen, Raleigh
N. D.	Yes	R. L. Post, Fargo	No	
N. S.	Yes	E. A. Karmo, Truro	Yes	E. A. Karmo, Truro
Ohio	Yes	W. E. Dunham, Columbus	Yes	Chas. A. Reese, Columbus
Okla.	Yes	G. A. Bieberdorf, Stillwater	Yes	C. F. Stiles, Stillwater
Ont.	Yes	G. F. Townsend, Guelph	Yes	G. F. Townsend, Guelph
Ore.	Yes	W. P. Stephens, Corvallis	Yes	W. P. Stephens, Corvallis
Pa.	Yes	E. J. Anderson, State Coll.	Yes	W. W. Clarke, State College
Que.	Yes	H. J. Plourde, Levis	No	
Sask.	No		Yes	
S. C.	Yes	D. Dunavan, Clemson Col.	Yes	M. Sparks
S. D.	Yes	Robert Walstrom, Brookings	Yes	Robert Walstrom, Brookings
Tenn.	Yes	B. S. Pickitt, Knoxville	No	
Texas	Yes	V. A. Little, College Station	No	
Vt.	No		Some	Geo. B. McCollom, Burling.
Va.	Yes	J. M. Green, Blacksburg	Some	John M. Amos, Blacksburg
Wash.	No		Some	Carl Johansen, Pullman
Wisc.	Yes	C. L. Farrar, Madison	No	

Note: Where we did not hear from a state we repeated last year's listing.

Observations of an Amateur During the 1955 Season

C. D. CANNON, Warren, Pa.

THE PROFITS for the hobby beekeeper are largely in the pleasure and experience gained through intensive care and close observation of a small number of colonies. This last season, I not only made some money, but saw several new sights, and made two successful tests of my ideas.

In the fall of 1954 I had four colonies in one location, three heavy and loaded with bees, and one small late swarm to which I had to give several frames of honey for winter food. One strong colony froze out leaving at least 35 pounds of good honey. Late in February, I started feeding the remaining three colonies some dark strong honey and they picked up rapidly.

Early in May the strong colonies were crowded so I gave each a hive body of combs from the winter-killed colony. Combs were shifted between the vacant hive bodies and the others so there was young brood in all. A queen excluder and an inner cover with the escape hole open was put under each top hive body. The queens were below the excluders. In a week one hive had queen cells on several frames, but the other had none. However, I removed the top stories anyway and set them up as new colonies. I shook off the bees and transferred one frame with queen cells to the other new colony and left them for a week.

One new colony progressed as expected, becoming strong early so as to produce some surplus light honey. The colony receiving the transferred queen cells promptly tore them out and at the end of a week had made two new small cells over worker brood cells that were obviously too old to make queens. Strangely, they did produce a queen that mated and produced worker brood, but she was small and had some of the abdominal striping of a worker. The hive was watched closely, and late in June there were several normal queen cells, and the "half-queen" was missing. Since I did not know the age of these cells, I checked more frequently to be sure the supersedure was safely done. Finally I found

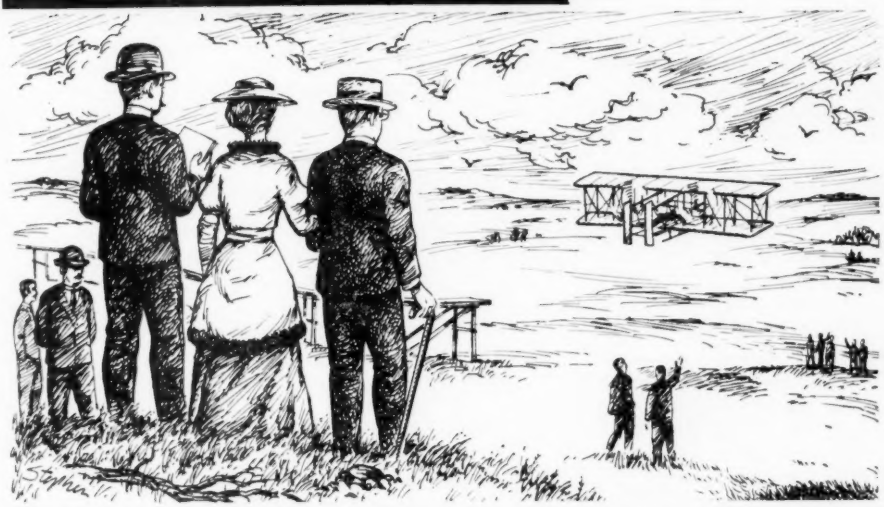
one cell open, so started looking for the young queen. The hive was quite populous and progress slow, but I finally noticed five or six bees running single file among the others. In the lead was the young queen trailing half an inch of the bridegroom's "innards". She developed properly, and the colony built up strong and heavy for winter.

After the "splits", as I called them, had been taken from the two strong colonies, I gave them each two half-depth supers, but put a ⅜ inch rim under the supers, with a 4 inch wide entrance at the front. Both colonies started using these top entrances excessively, and field bees were always clustered around them and falling in clusters to the landing board. To avoid this, I made some new rims ⅜ inch thick and the same size as the hive body. The front was open and the side members extended 2½ inches at the front. Wedges 2½ inches long, and ⅝ inch high tapered to nothing, were nailed under the extensions. A landing board 2½ inch by ⅜ inch by 16¼ inches were nailed under the wedges. The result was a full width top entrance ⅜ inch high with a sloped landing board. I firmly believe this was some help to the bees, as each of these colonies produced about 250 pounds of surplus honey. Neither colony produced brood above this entrance. Both colonies made numerous burr comb "ladders" in the space and both colonies covered the ends of the frames below these entrances heavily with propolis.

Altogether it was a good year. I started the winter with four colonies and ended with three in the spring; built them up to five; got 225 pounds of light and 548 pounds of amber extracted honey, also got a good block of cappings wax. Got stung numerous times and spent a lot of spare time pleasantly.

Bee Lore

Illustrated by V. R. Stephen



Mans' first airplane flight recorded in Gleanings. After the Wright Brothers made their historical flight at Kitty Hawk, N. C., they were unable to record the event in any scientific journal because the editors thought it was a hoax. So a personal friend of the Wright Brothers, A. I. Root, of Medina, Ohio, published the story of the flight in the March 1, 1904, issue of GLEANINGS IN BEE CULTURE. Thus it remained for a beekeeping journal to publish the first report of man's first successful attempt at flight.

Just News

The **Worcester County Beekeepers' Association** will hold its first out-door meeting at the home of Mr. and Mrs. Warren Newton, 66 Gold St., Shrewsbury, Mass., on May 19 at 1:30 P.M. Bring basket-lunch and chairs and table. Coffee and cream will be served. —Adolph W. Rozenas.

At a recent meeting of the **Essex County Beekeepers' Society,** the following officers were elected to serve as members of the executive board for 1956-1957:

President — F. Parker Joralemon, Bloomfield, N. J.; Vice President — Louis M. Panagini, Nutley, N. J.; Secretary — Charles Maurer, Bloomfield, N. J.; Publicity — Otto Eberle, Caldwell, N. J.; Educational — Paul Grierson, Maplewood, N. J.; and Manuel Calvache, North Caldwell, N. J.; Executive Secretary — Viola L. Jungfer, Bloomfield, N. J.; Program — John Butterworth, Nutley, N. J.

The **Empire State Honey Producers' Association** will start sending a periodic newsletter to members, the first to be mailed in July. All members are urged to send in news items and a list of what they might want to buy or sell.—M. R. Cary, Sec.

The **Peace River District Beekeepers' Association** of Alberta, Canada, was formed recently, with Harve Johnson as President, Paul Emile, Vice President, and Maurice Despine, Secretary-Treasurer.

The **Eastern Missouri Beekeepers' Association** will hold its annual field meet at Shaw's Garden Arboretum, Gray's Summit, Missouri, on Sunday, May 20. A queen will be chosen and attendance prizes awarded.

The **Westchester County Beekeepers' Association** will hold its last indoor meeting at the Odd Fellows Hall, 20 Lockwood Avenue, New Rochelle, N. Y., on Sunday May 20th, at 2:30 P.M. The topic of discussion will be "Swarm Controlling" and "Toxic Sprays". We also plan to start our Club Hive, which will be given to some lucky member at the end of the season. Visitors are welcome. Refreshments will be served by the "Queen Bees". — Mrs. Alfred Roth, Publicity.

The **Annual Short Course** for beekeepers will be held at Ames on May 8 and 9 in the Memorial Union. The guest speaker will be Dr. Leonard Haseman, Professor Emeritus of Entomology, University of Missouri. Dr. Haseman's presentation on the use of sulfa for control of American foulbrood will be of interest to every honey producer. The two days will be complete with topics of vital interest to every honey producer. The complete program will be available by May 1.— F. B. Paddock, Extension Apiarist.

Louis H. Scholl, prominent beekeeper of the early days, passed away in New Braunfels, Texas, on March 26 at the age of 75. For some years he was among the most extensive operators of apiaries in the state. Old-timers will remember him as an exponent of the divisable brood-chamber hive and bulk comb honey. He was a former member and officer of the National Beekeepers' Association, Texas Beekeepers' Association, and Texas Honey Producers' Association.

Mr. Scholl was a pioneer in foulbrood control, serving as the first State Apiary Inspector from the office of the State Entomologist. He later served as Representative to the Texas State Legislature and was instrumental in the creation of the Texas foulbrood law of 1913, which is still the basis of the present law.

Scholl was a regular contributor to various beekeeping magazines. For many years he conducted the columns **Beekeeping in the Southwest** in Gleanings in Bee Culture and **Southern Beedom** in American Bee Journal. In 1916 he founded **Beekeepers Item** and served as its editor for some years. Failing health caused his retirement from beekeeping some years ago.

The **Cuyahoga County Beekeepers' Association** of Ohio will meet Sunday, May 20, at 2 P.M. in Miles Avenue Church of Christ, 9200 Miles Ave. A cordial invitation to all.

The **Midwestern Beekeepers' Association** will meet May 20th at Unity Farms, Lee's Summit, Missouri, in the "Apple House" on Colburn Road at 2:30 P.M. Program under discussion will be: Supering; Swarm Control; Location of Apiary; and Pollination. Door prize, refreshments, and tour. All persons interested in beekeeping are welcome.—Mrs. William Brite, Sec.

Queen Bee Rearing Short Course—The College of Agriculture at Penn State will conduct a three-day course in how to rear queen bees from June 18 to 20, 1956. The course will include discussions and actual work in the subject. Any adult may enroll by writing to Director of Short Courses, College of Agriculture, The Pennsylvania State University, University Park, Pa.

The 14th annual **Short Course in Beekeeping** will be given May 9, 10, and 11, at the St. Paul Campus of the University of Minnesota. M. H. Haydak, C. D. Floyd, T. A. Gochnauer, T. L. Aamodt, and W. C. Rothenbuhler will appear on the program to present various phases of beekeeping. There will be movies and a question box. A cordial invitation to all.

The first outdoor meeting of the season of the **Middlesex County Beekeepers' Association (Mass.)** will be held on Saturday May 26, 1956. The Club Hive will be inspected, a business meeting will be held, and a picnic supper will conclude the day. The meeting will begin at 2 P.M.

At the April meeting a new slate of officers for the 1956-1958 term was elected by the members present. Tentative plans of the new officers include the naming of a publicity committee to give better and wider publicity to our activities; the donation of a hive of bees to a young 4-H club member, or a Future Farmer of America member; and selection of outstanding speakers on bee culture for indoor meetings next fall and winter.

At our April meeting our members brought for display, various self-styled inventions or gadgets which they have adapted for use in their beekeeping activities. Many good ideas were shown.—L. C. Proctor, Sec'y.

New Jersey Bee Inspector Retires After 21 Years

PAUL L. HOLCOMBE of Lambertville, New Jersey has retired from the N. J. Agriculture staff after directing the educational and regulatory functions and bee culture projects for 21 years. Jacob C. Matthenius of Phillipsburg, N. J. who has been assisting Holcombe, is carrying on the State project.

Holcombe served under the late Elmer G. Carr of Pennington, New Jersey, and when the latter retired in 1935 Holcombe was appointed inspector of bee culture in New Jersey.

Born in Mount Airy, New Jersey, Holcombe developed an interest in bees at a very early age. When he was 17 he purchased one pound of medium brood foundation from A. I. Root for 60 cents and made his first movable frame hive.

During his early years Holcombe produced comb honey and later on extracted honey. As the number of colonies increased he purchased modern bee hives, some of the equipment still being in use today. Holcombe plans to increase his number of colonies and also to grow holly.

Paul L. Holcombe

Beekeeping in Ireland

BROTHER COLMAN, O.S.B., Glenstal Priory, Ireland

WE ARE SLOW to appreciate the financial benefits to be had from beekeeping here in Ireland, as there are a very few commercial beekeepers. Yet we certainly don't lack in small beekeepers, as they are to be met everywhere. Individually there are not a great many owners of honey extractors but the happy principle of a small group uniting for the purchase of one is usual.

For the amount of honey produced it is surprising how small the percentage of it is extracted honey. But the Wexford Beekeepers' Association and Co-operative Society is doing great work to get apiarists to appreciate this real benefit. This Society was established chiefly for marketing honey and it is very successful.

You will be shocked to know that smothering bees is still practised sometimes and in places bees are still kept in skeps. Here in County Limerick there are farms where some years ago as many as 40 and 50 skep hives were kept in a plot of ground and called the Bee Haggard. Many of these were hit hard by disease but they now keep a couple of movable-frame hives and produce comb honey for home use and a bit to give to friends.

The point about these skeps was that many swarms got away and settled down in hollow trees, under roofs, and the like. Many of these have lived on and usually swarm every summer so even where bees are not properly kept there are not many of the country folk who don't see swarms every summer. I am sure our mild winter has everything to do with this. Sometimes, however, the choice of the scout bees hits on a tree with damp location and they fail to winter, chiefly because of this dampness.

Surprisingly enough the very same place may be hit on again the following summer by another swarm. These stray swarms attract many a venturesome farmer, who, armed with a butterbox (13 inches square at the top and 12 inches square at bottom and 13½ inches deep), gloves, and a sheet or part thereof, catches the swarm and lets them fare for themselves. The following spring he gets a neighboring beekeeper to drive the bees and hive them in a movable-frame hive. A queen excluder is placed on the frames and then the butter-box used as a super. Likely he will have 20 or 30 pounds of honey in his "super" later on and in the meantime add a double brood chamber and a crate of sections. By early September when he takes back his bees from the heather he has something worth while.

Our summers are not ideal for monster crops of honey as they are fairly wet, and very much so sometimes. Nectar yielders, however, are to be had over a long period beginning in February when the traditional gorse or whin bushes bloom (these are to be had almost everywhere, and how the bees appreciate them!), and ending in October, when the ivy, also very plentiful, provides the final precious drops of nectar.

There are always many varieties of wild flowers growing profusely along the hedge-rows and ditches, of which we are very proud. Here, although it's against the law, the country folk slip out their few cows, horses, asses, and goats too, who appreciate them with the bees. Of course, this is on the less important roads. We have also miles of hedging consisting of lilac, weeping willow, sallies, whitethorn, blackthorn, hazels, and brambles, etc., all very useful.

The month of August mainly is "heather season" and is a great boon as little else is to be had then, and we are rich in bog and heather in most parts of the country. In some places it amounts to miles of heather stretching in all directions, but here alongside us we have very conveniently about 300 acres. For the farmer it is no great boon in some parts as it can only be used for growing trees. However, where the bog is deeper it provides his entire fuel. Ling heather is the species, which is most common and this gives

(Continued on page 311)

Asked & Answered

To Prevent Rusting of Honey Cans

Question: How can honey cans be treated to prevent rusting?—Illinois.

Answer: Some use cans that are lacquered to prevent rusting, but if the honey is stored where there is not much variation in temperature, there should not be trouble from rusting when ordinary tin cans are used. Rusting is usually brought about in cans filled with honey by a wide variation in temperature. When honey becomes cold during a cold spell of weather it warms up so slowly when the weather turns warmer that the cold metal exposed to the warmer atmosphere brings about condensation of moisture on its surface. This explains why empty cans are less inclined to rust than cans filled with honey, since the air inside the empty cans warms up rapidly when the outside temperature rises, so that the metal remains at about the same temperature as the atmosphere, therefore condensation does not take place.

Weight of Bees

Q. How many worker bees are there in a pound?

A. Work done years ago on measuring the weight of bees seemed to show that there were from 4000 to 5500 worker bees to the pound. Five thousand empty bees to the pound has been accepted as the correct average.

Later work by the U. S. Bee Culture Laboratory under Jas. I. Hambleton, showed this figure was too high. Mr. Hambleton, under date of July 23, 1939, writes as follows: "We find it unreliable to use the common figure 5000 bees to the pound; consequently, we always take a representative sample, weigh this, count the bees and then make the calculation of the number of bees to the pound.

"In Technical Bulletin, No. 309, 'The Development of Package Bee Colonies' (page 24, table 9) Mr. W. J. Nolan gives some figures of the average weight of individual bees received in packages. The minimum average weight for these packages was 102.71 milligrams per bee. It would require 4416 bees of this weight to make a pound. The maximum average weight was 168.06 milligrams per bee or 2705 bees per pound. The average weight samples taken from 45 packages was 135.85 milligrams per bee or 3337 bees per pound. Mr. Frank Todd, in charge of our Pacific State Bee Culture Field Laboratory, has sent us some data in which the average is only 2608 bees per pound. Since the number of bees per pound is of particular interest in connection with package bees and since package bees are usually well fed at the time or shortly after they have been put in cages, 3500 bees per pound is probably a more accurate figure than 5000 bees per pound, under average conditions."

There is a slight variation in the size of different races. Taking all these factors into consideration the actual number of bees to the pound may run from 2608 (Todd) to 4416 (Nolan). And so it would seem that 3500 bees to the pound is a safe average.

Froth on Honey in Bottles

Question: What causes honey stored in a cement honey-house, which is rather damp, to form a white froth when extracted and placed in bottles? It looks as though it is fermenting and is rather thin. —New York.

Answer: Your last sentence would indicate that the honey may have absorbed moisture before it was extracted, while stored in the damp honey-house, for it should not be thin now if it was well ripened and mostly sealed before you took it from the bees. Unless it was stored for some time in this room before being extracted it should not have absorbed much moisture in this way. You can tell by smelling or tasting if any of it is fermenting. Even a slight fermentation can be easily detected in this way. When heated honey is put into bottles the air bubbles rising to the surface sometimes form froth on the top, even on thick well-ripened honey. This can be avoided by having the honey-gate attached to a hose from the filling tank, the honey-gate having a long snout by which the stream of honey can be directed to the bottom of the bottle, the gate being lifted as the jar is filled. Honey that is slightly fermented can be improved by heating not above 150 to 160 degrees F. to drive off the alcohol; but, if there has been much fermentation, the delicate flavor of the honey will be destroyed.

Buy and Sell

Only responsible advertisers and honest advertisements will be admitted to these columns. References required from new advertisers not known to us. Rate: 18c per counted word, each insertion. Each initial, each word in names and addresses, the shortest word such as "a" and the longest word possible for the advertiser to use, as well as any number (regardless of how many figures in it), count as one word. Copy should be in by the 10th of the month preceding publication.

HONEY FOR SALE

WE BUY AND SELL all varieties of honey. Any quantity. Write us for best prices obtainable. The Hubbard Apiaries, Onsted, Michigan.

IOWA honey, one can or truck loads. Russell D. Smalley, Beaver, Iowa.

Light and amber comb honey. Abram Brubaker, Rt. 2, Lancaster, Pa.

250 cans white clover honey. Selmer Markestad, Canton, Minnesota.

HONEY FOR SALE, can or truckload. Lloyd E. Allen, Tipton, Michigan.

CLOVER extracted honey in sixties. Abram Brubaker, Lancaster, Rt. 1, Pa.

650 60's of white honey. John Burghardt Apiaries, New Ulm, Minn.

HONEY AND WAX WANTED

BEEKEEPERS TAKE NOTICE—We can not guarantee honey buyers' financial responsibility, and advise all beekeepers to sell for cash only or on C.O.D. terms except where the buyer has thoroughly established his credit with the seller.

CASH for all types extracted honey. Send sample and best price. Buckeye Honey Co., 3930 No. High St., Columbus 14, Ohio.

CASH FOR BEESWAX. Write as to quantity and we will quote price. Muench-Kreuzer Candle Co., Inc., Syracuse, N. Y.

HONEY WANTED — All grades and varieties. Highest cash prices paid. Mail samples. State quantity. HAMILTON & COMPANY, 2613 South Yates Ave., Los Angeles 22, California.

WRITE FOR Shipping tags and quotations on rendered beeswax. We buy from one pound up and if you have over 25 pounds let us work it into foundation for you at a 25 per cent saving. Walter T. Kelley Co., Clarkson, Kentucky.

HONEY WANTED, all grades in 60's. Mail samples, advise quantity, best price. M. R. Cary Co., 1112-14 E. Erie Blvd., Syracuse, N. Y.

WANTED — White extracted or comb honey. Send sample. Millersport Honey Company, Millersport, Ohio.

BEST CASH DEAL for your honey (any grade) and beeswax. Alexander Company, 819 Reynolds Road, Toledo, Ohio.

WANTED—All grades of extracted honey. Send sample and price. Deer Creek Honey Farms, London, Ohio.

BEESWAX WANTED — Highest prices paid in cash or trade for bee supplies. The A. I. Root Company, Medina, Ohio, Council Bluffs, Iowa, San Antonio, Texas.

WANTED, chunk comb and extracted honey. Mail sample and prices. Stoller Honey Farms, Latty, Ohio.

WANTED—Honey in sixty-pound cans, also beeswax, any quantity. L. E. Allen, Tipton, Mich.

CASH for Amber and Buckwheat Honey. Best cash price for wax. Hubbard, Onsted, Michigan.

WANTED: Light amber clover and fall-flowers honey, no buckwheat. Also white clover. Send sample and lowest price. Cloverdale Honey Co., Fredonia, N. Y.

FOR SALE

WRITE FOR CATALOG — Quality Bee Supplies at factory prices. Prompt shipment. Satisfaction guaranteed. The Hubbard Apiaries, Manufacturers of Beekeepers' Supplies and Comb Foundation. Onsted, Michigan.

THE BIGGEST BEE SUPPLY Catalog published (64 pages) free for the asking. Listing many items not found in other Catalogs. No agents—buy direct and save 20%. WALTER T. KELLEY CO., CLARKSON, KENTUCKY.

FOR SALE — New heart cypress 10-frame bottom boards. KD., 10 or more, $1.00 each; 50 or more, 90 cents each; 100 or more, 85 cents each. One nailed up sample postpaid. $1.25. Fred L. Poole, Elizabethtown, Rt. 2, Box 67, No. Car.

FOR SALE — 8-frame Root equipment for 700-colony apiary. Write for details to E. H. Wadleigh, Monte Vista, Colo.

FOR SALE—80 disease free colonies in two out-yards near M53 in Lapeer County. All two-story with two extra standard hive bodies and frames. Each colony factory made with inner covers, excluders, feeders. Locations go with bees. Prairie View Honey Co., 12303 12th St., Detroit, Michigan.

FOR SALE — Several thousand once-used 60-lb. cans, 30c each; also 1500 more than once-used cans, 20c. F.O.B., River Rouge, Honeymoon Products Co., 39 East Henry St., River Rouge, Michigan.

QUEENBEE PAINTING OUTFITS, $1.50 postpaid. Southwick Apiaries. Waban, Massachusetts.

FOR SALE; Forty used Buckeye double beehives. Write for particulars. Alfred Briggs, New Sharon, Iowa.

FOR SALE—Good new and used 10-frame equipment, two large tanks. Ray Wilcox, Odessa, N. Y.

FOR SALE—1,000 hives bees in 20 locations, can remain, 3,000 supers drawn comb, necessary equipment and license to pack liquid and Dyce process honey. Terms, half cash. Treasure Island Honey Farms, Mille Roches, Ont.

FOR SALE—Several hundred standard dovetailed hive bodies with 10 frames and comb, tops and bottoms. 430 Rhode Island, Royal Oak, Michigan.

FOR SALE—Good strong healthy colonies of bees up to 50 colonies in standard hives. Grover Pfister, 1007 East Henry St., Wooster, Ohio.

FOR SALE—115 colonies bees, supers, and equipment, all 10-frame. W. Rose, 913 West Sixth Ave., Flint, Michigan.

BEES AND QUEENS FOR SALE

We use all possible care in accepting advertisements but we cannot be held responsible in case disease occurs among bees sold or if dissatisfaction occurs. We suggest that prospective buyers ask for a certificate of inspection as a matter of precaution.

Three and four-frame nuclei for sale, one or a truckload. Walker Apiaries, Pharr, Texas.

CAUCASIANS—2-lb. package, $3.50; 3-lb. package, $4.50. Untested queens, $1.00 each; 100 for $85.00. Lewis & Tillery Bee Company, Rt. 3, Box 90, Greenville, Ala.

FOR SALE—Quality queens. Lynn Williams. Box 5760, Holly Lane, Paradise, California.

PACKAGE BEES—Take a vacation on your express money. Come for your bees; be our guest while here. 1800 hives to shake. Booking orders now. MILLER BROS., SAFFORD, ALA.

LIGHT 3-band and Carniolan bees and queens. 3 pound, $5.00; 5 pound, $7.00. Queens, $1.10, delivered price. Luther Pickett, Efland, N. C.

CARNIOLAN and CAUCASIAN queens, $1.00 each. Shipment starts April 20. I have the late Albert G. Hann strain of bees. Makes lots of white comb honey. Gentlest of all bees. Roy Waddell, Woodruff, S. C.

THE NORMA ROY APIARY ITALIAN BEES. 3 pound with queen, $3.75; 4 pound with queen, $4.50. Queenless package, deduct 75c per package. Live delivery and a health certificate. Norma E. Roy & Son, Hessmer, Louisiana.

Dark Italian Queens, 600-pound strain, bred for production, $1.00. With 2 pounds of bees, $2.95; with 3 pounds of bees, $3.80. Henry Loehr, Caldwell, Texas.

AVAILABLE IN APRIL AND MAY FOR THE FIRST TIME, the Yankee strain. Quality queens for maximum honey production. $1.35 each until June 1st. The Stricker Apiaries, Annandale, New Jersey.

ALL QUEENS airmailed. A few package bees. 2-lbs. with queen, $4.00; 3-lbs. with queen, $5.00. Cleve Sprouse, Jr., Woodruff, No. Car.

HONEY WANTED
Carloads and less than carloads. Mail sample and best prices in all grades.
C. W. AEPPLER COMPANY
Oconomowoc, Wisconsin

DARK ITALIANS
As GOOD As the Best

	Queens	2-lb. pkg.	3-lb. pkg.
1 to 10	$1.35	$4.00	$5.00
11 to 50	1.25	3.75	4.75
51 and up	1.15	3.50	4.50

Place your order early. The demand for good queens and packages will be larger than the supply.
WEAVER APIARIES
Navasota, Texas

1956 QUEEN BEES
3-Banded Italians
1-24 ..... $1.20 each
25 or more ..... 1.10 each
Geo. W. Moore
Shasta, Shasta Co., California

LITTLE'S APIARIES
ONLY source of ORIGINAL John M. Davis ITALIAN QUEENS

1-24	25-99	100-up
$1.35	$1.25	$1.15

Producers of ROYAL JELLY
P. O. Box 122
Shelbyville, Tenn.

Booking orders now. Over 30 years a shipper. Send for Free Circulars.
BLUE BONNET APIARIES
Weslaco, Texas

HONEY LABELS
Improved designs, embodying color, balance, simplicity, and distinction. Please send for free samples & prices.
C. W. AEPPLER COMPANY
Oconomowoc, Wisconsin

ITALIAN

PACKAGE BEES	1-24	25-99	QUEENS 100 up
2-lb.	$3.25	$3.10	$3.00
3-lb.	4.15	4.05	3.90
Queens	1.15	1.00	.95

GILBERTOWN APIARIES
Gilbertown, Ala. Phone: 2242
or Box 412 Milford, Michigan

WILLIAMS ITALIAN QUEENS
LARGE LEATHER-COLORED
THREE-BANDED
QUALITY SUPREME
CERTIFICATE WITH EACH SHIPMENT

1 - 9	Postpaid,	Airmail	$1.00
10 -99	"	"	.95
100-up	"	"	.90

DR. WILLIAMS APIARIES
115 W. Sterling Ave. Baytown, Texas

Caucasian QUEENS	1-99	Italians 100-up
2-lb. pkg. w/q	$3.35	$3.25
3-lb. pkg. w/q	4.35	4.25
Queens	1.25	1.15

CLARK'S APIARIES
Bunkie, La.

Healthy Italian Bees & Queens
Write for 1956 Prices
Georgia Bee & Honey Apiaries
P. O. Box 312 Hortense, Ga.

Keep

Gleanings

Coming

MAIL THIS COUPON TODAY

OR—GIVE TO A FRIEND

GLEANINGS IN BEE CULTURE:
Dept. E-2, Medina, Ohio

Yes! Enter my subscription to Gleanings for the period checked below:

☐ 1 yr. $2.00 ☐ 2 yrs. $3.50

☐ 3 yrs. $5.00

50c per year extra for foreign

Name .....

Street .....

City ..... State .....

☐ Remittance enclosed. ☐ Bill me.

MISCELLANEOUS

"Adventures in Beekeeping". Illustrated. $2.00. Robert Oglesby, R. R. 1, Middletown, Ohio.

PLAIN or wavy-wired foundation. Beeswax rendered and purchased. Wax Workers, Ithaca, New York.

ROYAL JELLY in capsules. Each contains 10 mg. Royal Jelly, 5 mg. Vitamin B, 5 mg, Calcium Pantothenate. Boxes of 30, $1.50 to beekeepers. Retails for $3.00. Prairie View Honey Co., 12303 12th St., Detroit 6, Michigan.

Royal Jelly produced fresh year around. Use it on burns. Price ($20.00 per oz.) O. K. Anderson & Son, Post Office Box 193, Coffee Springs, Ala.

WANTED—2-frame reversible extractor, 12 x 16 pockets. Albert Zinck, Streeter, No. Dakota.

HELP WANTED

WANTED — Full-time bee inspector. Must be experienced in working with bees. Good wages, car, and expenses furnished. References required. Write. Bureau of Plant Industry, State House, Lincoln, Neb.

SEEDS

HONEY PLANTS our specialty. Catalog on request. Pellett Gardens, Atlantic, Ia.

MAGAZINES

Know interesting facts concerning the bees of India through the INDIAN BEE JOURNAL, published in English by the Bhupen Apiaries (Himalayas), Ramgarrh Dist. Naini Tal, U. P. India, or available through them. Subs. Rs9/ or 15 shillings or $2.25 yearly. Sample copy post free for Rs1/8/, or s2/6, or 40 cents (International Money Order). Payment in mint postage stamps of your country accepted.

Archiv fur Bienenkunde, International journal for Bee Culture and beekeeping economics. Founded in the fall of 1918. Oldest economic bee journal in the world. Praised again and again for its decades of independent leadership through many endorsements and advice as a valuable source also for the practice. Classic. Yearly DM 5.50. Any aspiring beekeeping friend will receive a sample copy. Biene-Verglag, Giebelbach, Lindau, Germany.

BEE WORLD, the international journal of the Bee Research Association, published monthly, contains the latest research reports on bees and beekeeping. With Apicultural Abstracts it costs $3.00 per annum. Apicultural Abstracts only $1.75 per annum from the Hon. Subscription Secretary, Bee Research Association, 10 Barnett Wood Lane, ASHTEAD, Surrey, England.

Read the South African Bee Journal. Published every two months. Subscription 7/6 per year to the Treasurer, P. O. Box 3306, Cape Town, South Africa.

INTERESTED in Angora Goats? Read the Sheep and Goat Raiser, Hotel Cactus, San Angelo, Texas, the only ranch magazine published serving the Angora Goat industry. Subscription $1.00. Sample copy, fifteen cents.

U. S. Savings Bonds come in all sizes . . . . . and grow bigger every year.

Carniolan and Caucasian

Requeen your swarms and increase with young laying queens for quick build-up. Caucasian and Carniolan are the gentlest of all races of bees, build white comb, work in cool weather and not bad to drift into other colonies. hence less liable to disease. Laying queens $1.30 each air mailed. $2.00 each to foreign countries. No more packages this season — queens only.

W. D. REAMS
LaBelle, Fla. Box 87

QUEENS
3-BAND ITALIANS

Untested Queens	$1.00 each
Tested Queens	2.00 each
2-lb. Pkg. with Queen	4.00 each
3-lb. Pkg. with Queen	5.00 each

Safe arrival and satisfaction guaranteed.

JOHN A. NORMAN
Rt. 1 Grady, Ala.

BEEKEEPING IN IRELAND

(Continued from page 306)

a dark honey which is an excellent seller.

How much honey may you hope for from each colony you take to heather? This is a very interesting point as it means when the honey flows proper are over you can look forward to this extra crop. I know one progressive beekeeper who has got as much as 56 pounds per colony. This is due, he claims, to the big number of foragers.

It is claimed by many that American hives are not suitable here but again the venturesome are proving otherwise. Our Irish hives are mostly the C.D.B. type, and they look very well in a garden, being quite picturesque. Yet for those who wish to keep a number of hives they are much too expensive to buy and far too difficult to make. Steadily growing in popularity is the Dublin (interchangeable) hive. This takes ten standard frames and you can add on deep or shallow supers as you wish. They are simply made also, and I have seen boys of 15 and 16—who won't be carpenters—make them excellently, and cheaply. I know more beekeepers-to-be who are imitating them.

Have You Ordered?

It's later than you think.

Do not delay. The best service is had when orders are placed early. Give alternate date in case we cannot book as requested.

Package Prices with Rossman Regular Queens

	2 lb.	3 lb.
1-24	$4.00 ea.	$5.00 ea.
25-99	3.75 ea.	4.75 ea.
100 or more	3.50 ea.	4.50 ea.

Island Hybrid Queens add 25c ea.

"They Produce"

Mainline night shipments

Rossman Apiaries
P. O. Box 133
Moultrie, Ga.

QUEENS

ITALIANS CAUCASIANS

	1-24	25-99	100-up
Nice large queens	$1.05	$1.00	$ .95

May 21st to June 1st, 85c each.
Summer and Fall queens, 65c each.

Send us your order of 1 or 1000

Mitchell's Apiaries
Bunkie, La.

QUEENS
By Air Mail

1 to 25 ..... $1.00 each
26 up ..... .85 each

Phone No. 466 R5

O. K. Anderson & Son
Coffee Springs, Alabama
Post Office Box 193

SUE BEE SAYS:

WOW! Are Your Bees Busy Now! Make Extra Profit by Taking Advantage of These Specials.

In order to better serve you we have ample stocks of all type bee supplies on hand. Compare our prices with what you have been paying.

Standard Brood Frames		$12.25 per 100
Standard Hive Bodies		9.25 per 5
5⅜" Supers empty		5.95 per 5
6¼" Supers empty		6.95 per 5
Wood Covers		6.15 per 5
Cypress Bottoms		6.35 per 5
Queen Excluders		12.50 per 10
Sodium Sulfathiazole		$ 4.50 per pound
N. F. Powder Sulfa		4.50 per pound
Terramycin 5	(2000 feedings)	43.00 per 50 lb. pack
Terramycin 5	(40 feedings)	1.25 per pound
Fumidil B	(9.5 gram bottle)	24.50 per bottle
Vet Strep	(75 gram bottle)	6.00 per bottle
SUE BEE Outside White Paint		$ 4.95 per gallon
SUE BEE Aluminum Paint		4.35 per gallon

SUE BEE FOUNDATION is available in all regular sizes and can be made up in any special size or weight the beekeeper may desire. CONTACT US FOR PPRICES.

Write for Our 1956 Bee Supply Catalog.

SIOUX HONEY ASSOCIATION

SIOUX CITY, IOWA

Bee Supplies are now stocked at the following plants: Sioux City, Ia.; Lima, Ohio; Rogers, Texas; Waycross, Ga., and Anaheim, Calif.

"Old Reliable" BERRY'S Italian Bees

THE PREFERRED STOCK OF LEADING HONEY PRODUCERS

Oldest Package Shipper South — The Best in America

Age, Ability Experience Count — Sixty-One Years With The Bees

Thousands of Colonies and Nuclei — Accredited and Certified Alabama Bees

America's Best Package Bees and Finest Queens INSURE your honey crop with DEPENDABLE BERRY Bees (90% of our package bees are under 10 days old).

After 61 years of Select Breeding, we have settled on our strain of Italian bees as being unsurpassed by ANY stock, Hybrid or otherwise, in their relation to honey production, disease, and nosema resistance. We have bred repeatedly from MAJOR advertised strains, and abandoned them all as unequal to our "OLD RELIABLE" stock. "OLD RELIABLE" bees assure you that you have bought the best to be found, regardless of price. They are the Standard of the Beekeeping Profession, in leading honey producing areas. We maintain several branches in the Northwestern States that enable us to test our strain from both honey production and climatic standpoints. All this, along with Competent Breeding, assure you that when a better stock is produced, "OLD RELIABLE" will be the name.

PRICE LIST OF OUR QUEEN BEES AND PACKAGES OF BEES WITH YOUNG QUEENS

	Quantity Queens	2-lb. w/q	3-lb. w/q	4-lb. w/q	5-lb. w/q
Prices to May 15th:	1-24	$1.25	$4.00	$5.00	$6.00	$7.00
	24-99	1.10	3.75	4.75	5.75	6.75
	100-up	1.00	3.50	4.50	5.50	6.50
Prices from May 15th:	1-24	$ .95	$2.95	$3.95	$4.95	$5.95
	24-99	.90	2.85	3.85	4.85	5.85
	100-up	.85	2.75	3.75	4.75	5.75

For prices on queenless packages, deduct price of queen; all prices F. O. B. Montgomery, Ala.

All our queens are selected. We have but one grade. The culls, we destroy. Only those that we would use in our own apiaries do we sell to our customers. Wings of queens are clipped free of charge on request.

Safe arrival we guarantee on everything we ship, whether packages or queens. All orders will be filled on the dot unless weather conditions are such as to make it absolutely impossible to ship. We have no disease. Our apiaries were the first in the state to be inspected and were found absolutely clean of disease. Directions telling how to handle and a Certificate of Health accompany all shipments. May we book your order NOW? Deposit of $1.00 per package required for booking. Remainder remittance in full ten days before shipping date.

References: Union Bank & Trust Co., Montgomery, Ala. Any Bee Journal in the United States or Canada. Ask your Extension Agent about us.

M. C. BERRY & SON

M. C. BERRY, Pres. — CLINTON C. BERRY, Gen. Mgr.

P. O. BOX 684 — MONTGOMERY, ALABAMA

BETTER BRED QUEENS

Three-Banded Italians

She will do the job. Give our BETTER BRED QUEENS a try and be among our many satisfied customers.

2-lb. pkg. w/q	**$3.50**	**after May 15th**	**$3.00**
3-lb. pkg. w/q	**4.25**	**" " "**	**3.75**
Queens	**.85**	**" " "**	**.75**

CALVERT APIARIES — Calvert, Alabama

EXPERIENCES WITH PACKAGE BEES

(Continued from page 285)

at this early date so that they will have ample time to build up for the main honey flow. There is no profit in having package bees arrive only several weeks before the flow. To obtain a crop from a package it should have six to eight weeks in which to build up for the honey flow. If weather conditions are favorable the package should build up to a fairly strong colony.

In summing up all the conditions that have prevailed in my years of experience with packages I have found that they can be profitable. However, the beekeeper must always give consideration to any condition that may occur and should be prepared to meet any emergency that may arise.

FRAMEWORK ITALIAN QUEENS

Young, laying untested queens

1-24, $1.00; 25-99, $ .95; 100-up, $ .90

BOB GALE'S APIARIES

Box 472 — Bunkie, Louisiana

WANTED—Beekeeper or helper to work bees in Ohio summer, and in Florida winter. W. March, Rt. 3, Bx. 65, Mantua, O.

THREE-BAND and PURE THREE-WAY D. R. ITALIAN PACKAGE BEES and QUEENS

We ship pure worker bees by mail, express, or truck. We guarantee live arrival. We ship you the package with the queen introduced or regular caged in the package, whichever you like.

1956 Prices — Each with a Young Laying Queen

Each	2-Pound	3-Pound	4-Pound	5-Pound
1 to 11	$4.00	$5.00	$6.00	$7.00
12 to 29	3.80	4.75	5.70	6.65
30 or more	3.60	4.50	5.40	6.30

Untested Queens, each, $1.35; Tested queens, each $2.00.

If queenless bees are wanted, deduct $1.35 from the package price.

JACKSON APIARIES P. O. Box 58 FUNSTON, GEORGIA U.S.A.

CAUCASIAN or ITALIAN

Package Bees and Queens for 1956

Gentle bees, less swarming, good producers, health certificate and live arrival guaranteed are just a few things you get when your requirements are sent to me. No extra charges on orders booked in advance.

	1-25	25-50	50-100
2-lb. pkg. w/q	$3.70	$3.45	$3.20
3-lb. pkg. w/q	4.60	4.30	4.00
4-lb. pkg. w/q	5.50	5.15	4.80
5-lb. pkg. w/q	6.40	6.00	5.60
Queens	1.20	1.10	1.00

FARRIS HOMAN
SHANNON, MISS.

HARPER'S FAMOUS HIGH QUALITY

ITALIAN QUEENS & PKG. BEES

Quantity	1 to 24	25 & up
2-lb. pkg. w/q	$3.25	$3.00
3-lb. pkg. w/q	4.25	4.00
4-lb. pkg. w/q	5.20	5.00
5-lb. pkg. w/q	6.15	6.00

QUEENS 1-9 $1.10 ea. 10 & up, $1.00 ea. Bees are very prolific and extra good honey-gatherers. Please send us your order and preferred shipping dates early.

CARLUS T. HARPER
New Brockton, Ala.

Why Not Buy the Best QUEENS!
Italians

1-25	25-100	100 up
$1.25	$1.15	$1.00

Ready to ship April 1st.
Guaranteed to please.

UNITED APIARIES
Box 276, Roxton, Texas

31 Years Experience
as
Queen Breeders

SPRING MANAGEMENT

(Continued from page 282)

Young queens are, as a rule, so ambitious they will lay far more eggs than an old queen, right up to quitting time in the middle of October. This resulting horde of young worker bees makes up the ones we now have in abundance to give the queen encouragement to lay vigorously and build up the colony in time to enable it to gather the main harvest.

If they are short of honey and pollen at this time (early spring), brood rearing is curtailed, and the colony will probably be worthless so far as gathering a crop later on is concerned. We must feed them either by giving sugar syrup or combs full of honey and pollen, saved from last season for just such an emergency. If the queen is a poor one, and consequently the colony weak, it should be united with a stronger one having a good queen. The newspaper method of uniting is advised, and the poorer queen should be hunted out and destroyed. In the fall, poor combs in the hive should be placed on the outside of the other frames so that they can now be removed and replaced with good ones; or the frames may be cleaned up and filled with full sheets of foundation.

With this early examination completed and the present necessities of the bees taken care of, we can leave them alone until the time when they will need more room for brood rearing or for storing honey. Do not forget that a good colony will consume 40 pounds or more of honey during brood rearing in the spring, so be sure there is that much in the hive now.

You'll get
BETTER BEES & QUEENS
From these members of
The American Bee Breeders' Ass'n.

Alamance Bee Company — La Belle, Fla. and Graham, N. C.
J. M. Cutts & Sons — Chipley, Fla.
Jackson Apiaries — P. O. Box 58 — Funston, Ga.
Jensen's Apiaries — Macon, Miss.
Little's Apiaries — P. O. Box 122 — Shelbyville, Tenn.
W. E. Plant — Rt. 2 — Hattiesburg, Miss.
The Puett Company — Hahira, Ga.
Rossman Apiaries — P. O. Box 133 — Moultrie, Ga.
Stover Apiaries — Mayhew, Miss.
Sunkist Bee Co. — Convent, La.
Weaver Apiaries — Navasota, Texas
Wicht Apiaries — 406 Miller St. — Hattiesburg, Miss.
Wilbanks Apiaries — Claxton, Ga.
York Bee Company — Box 300 — Jesup, Ga.

"HIGH QUALITY IS **ALWAYS** A BARGAIN"

ITALIAN "GULF BREEZE" QUEENS

Booked to capacity on packages for rest of season. Plenty of good queens available at the following prices:

Quantity	Queens	Quantity	Queens	Quantity	Queens
1-9	$1.35	10-49	$1.25	50 up	$1.15

BESSONET BEE COMPANY Donaldsonville, La.

PACKAGE BEES ITALIAN QUEENS

Good Producers — Gentle
You will like them. Good service.

A. R. BANTA Los Molinos, Calif.

Protect Your Future. Buy Your Savings Bonds Now.

The Picture Bee Magazine
If you are taking time to read, why not read the best? Condensed to save you time. Illustrated to give you pleasure.
Modern Beekeeping
Clarkson, Kentucky

The New Zealand Beekeeper
The Quarterly Magazine of the National Beekeepers' Association of New Zealand. Better Beekeeping—Better Marketing. Subscription, 8 shillings per year, payable to
THE GENERAL SECRETARY
Box 19 Foxton, New Zealand

STOVER'S SUMMER PRICES

It's not too late to boost those backward colonies up with a few two or three-pound packages, and we will have lots of good queens available after about June first.

Prices After May 20th, 1956

In lots of	Queens	ITALIANS 2-lb. & Q.	CAUCASIANS 3-lb. & Q.	4-lb. & Q.	5-lb. & Q.
1 -24	85c	$3.50	$4.25	$5.00	$5.75
25-99	75c	3.00	3.75	4.50	5.25
Large lots ..	70c	2.75	3.50	4.25	5.00

Tested Queens $2.00 each

Queens Postpaid — Airmailed — Clipped — No Extra Cost
For Queenless Package Deduct Price of Queen.
Packages F. O. B. Shipping Point

THE STOVER APIARIES

Mayhew, Miss.

TO THE READERS OF GLEANINGS

We Want to Sell

Finest Quality Queens ..... $1.10 each

	1-24	25-99	100-up
2-lb. pkg. of bees with queen	$4.00	$3.75	$3.50
3-lb. pkg. of bees with queen	5.00	4.75	4.50

Three-Band Italians. Live Delivery Guaranteed. Order direct from this ad.

J. F. McVAY

Jackson **Alabama**

THE CREAM OF THE CROP!

May packages of Baby Bees and "Starline" Improved Four-way Hybrid or "Magnolia State" Italian Queens will pay handsomely in many localities. Honey is in big demand at good prices. Wire or telephone us (122M) your order today; we can ship within 48 hours.

DADANT'S STARLINE HYBRIDS

Reg. U.S. Pat. Off.

PRICES:

Quantities	"Starline" Hybrid Queens	"Magnolia State" Ital. Queens	2-lb. Pkgs. W/Qs	3-lb. Pkgs. W/Qs
1-24	$1.60	$1.35	$4.00	$5.00
25-99	1.50	1.25	3.75	4.75
100-up	1.40	1.15	3.50	4.50

Package prices quoted are with Italian queens.
Same with "Starline" Hybrid queens, add 25c each.

All Hybrid queens clipped and marked FREE. Italians on request.
From Fumidil-B fed cell-builders and mating nuclei.

JENSEN'S APIARIES MACON, MISS. U. S. A.
"Where QUALITY is First and Foremost"

THREE-BANDED ITALIAN PACKAGE BEES AND QUEENS

Shipped Anywhere in United States and Canada

1956 Prices F.O.B. Hampton, S. C.	Queens (each)	2-lb. & Queen	3-lb. & Queen	4-lb. & Queen	5-lb. & Queen
1 -24 pkgs.	$1.15	$3.75	$4.75	$5.75	$6.75
25 -99 pkgs.	1.05	3.50	4.50	5.50	6.50
100-up pkgs.	1.00	3.25	4.25	5.25	6.25

(For Queenless Packages Deduct Price of Queen)

Guaranteed safe arrival.
Health certificate with each shipment.
Queens clipped and painted if desired.
Shipper rated in Dun & Bradstreet.

TERMS: One-third with order, balance 10 days before shipment.

H. C. BRUNSON

P.O. Box 188 HAMPTON, SOUTH CAROLINA Phones: 2161 or 4581

Italian Queens

EUGENE WALKER
Rt. 2, Box 207
Live Oak, California

Light Italians

Higher production
Gentler bees
Better service
Attractive prices

Sunrise Apiaries

Petal, Miss.

BRIGHT 3-BANDED ITALIANS

NOW READY. Send us your rush orders. Prompt service, full weight, safe arrival, health certificate, and satisfaction.

34 Years as Shippers

— PRICES —	1-11	12-100
2-lb. pkg. with queen	$3.75	$3.50
3-lb. pkg. with queen	4.75	4.50
Untested queens	1.10	1.00
Tested queens	2.00	1.75

20% off on shipments made after May 20th

NORMAN BROS. APIARIES
Ramer, Ala.

FLOWERS' QUALITY ITALIANS

That stand test for honey gatherers; Gentle; Prolific; QUEENS BRED FROM HIVES MAKING 300 lbs. AND OVER OF HONEY. Fumagillin fed grafting and queen yards. HEALTH CERTIFICATE with each shipment.

All Packages F.O B. Jesup

QUANTITY	1-24	25-100	101-up
2-lb. pkg. w/q	$3.25	$3.00	$2.80
3-lb. pkg. w/q	4.00	3.75	3.50
4-lb. pkg. w/q	4.75	4.50	4.25
5-lb. pkg. w/q	5.50	5.25	5.00
QUEENS mated and laying	1.00	1.00	.90
TESTED QUEENS	2.00		

All Queens Delivered Airmail
Prompt live delivery guaranteed. Place orders now. Early orders have priority.

FLOWERS BEE COMPANY
JESUP, GEORGIA U.S.A.

BEES

(Continued from page 268)

tropical wasps have spiral ramps between combs and specialized storage facilities that would reflect credit on a modern city planner.

The superiority of the honeybee is most evident when we compare it in overall advancement with any other one kind of insect. Termites may excel in fecundity, but they live a life of darkness, extending their aimless galleries into a continuous food supply.

The ants have developed many specialized ways of food gathering and plundering, but their communication depends upon the simplicity of scent trails rather than the complex symbolism of the "language" of the bees.

Some of the paper wasp nests are things of beauty, but they are doomed to annual destruction except in the perpetual summer of the Tropics. Solitary wasps may show great individual ingenuity, but they lack the social organization that enables the honeybee to control its environment.

The conclusion is inescapable: the honeybee is at the pinnacle of the insect world. It is our good fortune that it should also be our greatest ally among the insects.

DADANT'S NEW IMPROVED STARLINE HYBRIDS and GARON'S THREE-BANDED ITALIANS

Share with others in the present favorable honey prices. Meet good prices with TOP PRODUCTION. A good way to accomplish this is to stock with NEW IMPROVED DADANT STARLINE HYBRIDS and GARON'S THREE-BANDED ITALIAN Package Bees and Queens.

Reg. U.S. Pat. Off.

Prices After May 26th

	QUEENS		Package Bees With Queens		
	Italians	Starlines	2-lbs.	3-lbs.	4-lbs.
1-24	$1.00	$1.60	$3.30	$4.25	$5.20
25-99	.95	1.50	3.20	4.15	5.10
100-up	.90	1.40	3.10	4.05	5.00

— Add 25c per package for Starline Hybrid Queens —
Queens Clipped and/or marked, when desired, without extra cost.

GARON BEE COMPANY Donaldsonville, La.

BEES QUEENS

The rearing of good Italian queens and bees is our only business.
46 Years' Experience
A Young Laying Queen with Each Package

	1 to 9	10-48	49 or more
2-lb. pkg.	$4.00	$3.75	$3.50
3-lb. pkg.	5.00	4.75	4.50
Queens	1.35	1.25	1.15

For larger packages, add $1.00 per pound. Young laying queens. Packages are full weight, young bees. Health certificate with each shipment.

PROMPT SERVICE
W. E. PLANT
Hattiesburg, Mississippi

HOWARD WEAVER'S
Caucasian Bees & Queens

Our 1956 Prices

Quantity	1 to 9	10-48	49-up
2-lb. w/q	$4.00	$3.75	$3.50
3-lb. w/q	5.00	4.75	4.50
Queens	1.35	1.25	1.15

Book early and be assured of your favorite shipping dates.

HOWARD WEAVER
Navasota, Texas

Quality Bred Italian Queens

Breeders selected from our Michigan Apiaries for High Production and Hardiness.

Qns. through Feb. and Mar. $1.25 ea.
" " April and May, 1.00 ea.
All queens shipped Air Mail.

WALTER D. LEVERETTE APIARIES
P.O. Box 364 Ft. Pierce, Fla.

J. E. WING & SONS
43 Years Continuous Service
Italian Package Bees and Queens
Our Specialty
Knights Landing, Calif.

LET'S TALK ABOUT HONEY PLANTS

(Continued from page 295)

secutive days from willow. In one week it had filled a deep super with extra white willow honey. This was between April 25 and May 1. In the southern states willow is usually a light amber color with only a fair flavor generally described as 'a weedy taste'."

Cassandra or **Leatherleaf** (**Chamaedaphne calyculata**). Several Massachusetts beekeepers have written me that they regard this bog shrub as a valuable spring honey plant. Fred Russell of Chelmsford reports that the bogs in which it grows are difficult of access by man, but bees navigate the areas easily. It blooms so early that it makes a fine spring stimulant and can be used to build up the colonies for apple blossom.

Mr. L. Wilson, San Antonio, Texas, wishes to know if Japanese Pagoda Tree (**Sophora japonica**) will thrive in his area. The tree is hardy as far north as southern New York and southern New England, but I see no reason why it might not grow in Texas provided it is watered during dry seasons. Actually a species of this genus, mescal bean or frijolillo (**S. secundiflora**), blooms in March or April in limestone hill country around San Antonio.

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